APPENDIX C
NONAQUEOUS PHASE LIQUID EVALUATION

DRAFT
NONAQUEOUS PHASE LIQUID EVALUATION

REMEDIAL INVESTIGATION/FEASIBILITY STUDY, NEWTOWN CREEK

Prepared by

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November 2016

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LIST OF ACRONYMS AND ABBREVIATIONS

Apollo Street Site	Greenpoint Apollo Street Creek Parcel
cm	centimeter
CM	creek mile
CSO	combined sewer overflow
DAR	*Data Applicability Report*
DAR Addendum	*Addendum to the Data Applicability Report*
DSR Submittal No. 3	*Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 3*
dynes/cm	dynes per centimeter
EEE	Ecology and Environment Engineering, Inc.
ESI	expanded site inspection
GEI	GEI Consultants, Inc.
NAPL	nonaqueous phase liquid
NAVD88	North American Vertical Datum of 1988
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
OU	operable unit
Phase 2 FSAP Volume 2	*Phase 2 Field Sampling and Analysis Plan – Volume 2*
RI	Remedial Investigation
RI Report	*Remedial Investigation Report*
SOP	Standard Operating Procedure
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

1.1 Background

The Newtown Creek Remedial Investigation (RI) data collection program was conducted in Phase 1 and Phase 2 under U.S. Environmental Protection Agency (USEPA) oversight, following methods and procedures described in USEPA-approved work plans. Phase 1 sampling was conducted between October 2011 and September 2013 and was intended to broadly characterize key chemical and physical features of the Study Area[1]. Phase 2 sampling was conducted between May 2014 and December 2015 to fill data gaps and collect additional data needed to support this evaluation, as well as other RI evaluations.

During Phase 1, the presence of nonaqueous phase liquid (NAPL), which is a separate phase material within the sediment bed, was confirmed at five locations in the Study Area. In addition to the locations where the presence of NAPL was confirmed in the field, USEPA reviewed field observations, sediment chemistry, and proximity to potential upland NAPL sites; USEPA identified 18 additional Phase 1 locations (20 cores) where NAPL might be present—these are referred to as Phase 1 USEPA-identified locations.

Phase 2 sampling was conducted to support multiple RI programs and objectives, including the subsurface sediment investigation program and the groundwater investigation program. One of the objectives of the Phase 2 investigations included characterizing Phase 1 locations where NAPL presence was confirmed and Phase 1 USEPA-identified locations where NAPL

[1] The Newtown Creek Superfund Site Study Area is described in the Administrative Order on Consent as encompassing the body of water known as Newtown Creek, situated at the border of the boroughs of Brooklyn (Kings County) and Queens (Queens County) in the City of New York and the State of New York, roughly centered at the geographic coordinates of 40° 42' 54.69" north latitude (40.715192°) and 73° 55' 50.74" west longitude (-73.930762°), having an approximate 3.8-mile reach, including Newtown Creek proper and its five branches (or tributaries) known respectively as Dutch Kills, Maspeth Creek, Whale Creek, East Branch, and English Kills, as well as the sediments below the water and the water column above the sediments, up to and including the landward edge of the shoreline, and including also any bulkheads or riprap containing the waterbody, except where no bulkhead or riprap exists, then the Study Area shall extend to the ordinary high water mark, as defined in 33 Code of Federal Regulations (CFR) §328(e) and the areal extent of the contamination from such area, but not including upland areas beyond the landward edge of the shoreline (notwithstanding that such upland areas may subsequently be identified as sources of contamination to the waterbody and its sediments or that such upland areas may be included within the scope of the Newtown Creek Superfund Site as listed pursuant to Section 105(a)(8) of Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA]).

might be present. Phase 2 data were also used to support the NAPL investigation (i.e., dual-purpose objective). A Phase 2 core logging procedure was developed to meet the objective of confirming the presence and extent of NAPL in sediment.

The Phase 2 procedure for identifying and confirming NAPL presence includes the following two steps:

1. Visual observations of potential NAPL in sediment cores are recorded during core processing.
2. The visual observations of NAPL in sediment cores are confirmed by a shake test.

"Potential NAPL" refers to sediment visual observations of possible indicators of NAPL, including sheen, blebs (discrete droplets), coating on sediment particles, or saturation in sediment pore spaces. The Phase 2 NAPL identification methods, including confirming the presence of NAPL using shake tests, are described in detail in Section 2.2.1.

In addition to Phase 1 and Phase 2 investigations, other investigations have been performed in the Study Area. As described in Section 2.3, those investigations included three National Grid investigations (GEI 2009a, 2009b, 2012), the Apollo Street Site investigation (EEE 2008), the USEPA expanded site inspection (Weston 2009), and the Former Laurel Hill Site (*Data Applicability Report* [DAR] No. 16) Operable Unit (OU) 6 RI (Anchor 2007). The other investigations were reviewed for usability to supplement Phase 1 and Phase 2 investigations in the characterization of the presence and extent of NAPL. Finally, additional lines of evidence were also considered and are discussed in Section 4.1.

1.2 Objective

The overall objective of this NAPL Evaluation is to characterize the presence, nature, and extent of NAPL in Study Area sediment and native material. The NAPL Evaluation incorporates data collected during RI investigation programs and data from investigations conducted by others (see Section 4.1) in the Study Area; it also considers the locations of potential point source discharges, including combined sewer overflows (CSOs) and industrial activities on upland sites adjacent to the Study Area (other lines of evidence).

2 NAPL INVESTIGATION AND DATA COLLECTION ACTIVITIES

This section describes the NAPL investigation activities conducted as part of the Newtown Creek RI program, including the methods used to describe and document the presence of NAPL observations in sediment. This section also describes other Study Area investigations that were reviewed and evaluated for data usability to supplement the NAPL Evaluation.

2.1 Phase 1 Investigation

The RI field sampling was designed to be phased, so that the results of the initial sampling efforts could be used to focus and refine subsequent sampling efforts. The Phase 1 investigation was performed to broadly characterize conditions in the Study Area and to identify areas or features of interest for sampling during the Phase 2 field program.

2.1.1 Phase 1 Field Methods for Describing Visual Observations

During Phase 1, procedures were established for documenting visual observations of sediment cores during processing. In the USEPA-approved Phase 1 *Field Sampling and Analysis Plan* (Anchor QEA 2011), visual observations in sediment cores were described in the following terms:

- Oil-stained – visible brown or black stains on sediment (fine-grained sediment)
- Oil-coated – visible brown or black coating on sediment (coarse-grained sediment)
- Oil-wetted – visible brown or black wetting on sediment, appearing as a liquid not held by sediment grains (pool)

Phase 1 terms were used to describe the general appearance of the sediment. The Phase 1 terms were developed for the Phase 1 investigation and differ from the Phase 2 terms, which were based on New York State Department of Environmental Conservation (NYSDEC) terminology. When visual observations, such as the presence of an oil-like material on sampling equipment, suggested that NAPL may be present, a shake test (i.e., placement of sediment and distilled water into a clean laboratory jar, which is shaken and allowed to equilibrate, to observe whether separate phase liquid separates out) was performed to confirm presence. During core processing, a "yellow coating" was observed on sample

spoons while processing 5 of the 142 Phase 1 cores. In each instance, the yellow coating on the spoon was coincident with interbedded layers or small pockets of coarser material where oil-wetted or oil-coated materials were observed. Shake tests were performed on sediment from the interval where the yellow coating was observed. A NAPL layer was observed on the shake test water surface for four of the five cores (NC048CSC, NC050ASC, EK004ASC, and EK005BSC). In the fifth shake test, NC071CSC, only a sheen was observed on the shake test water surface. In total, shake tests were only performed on 5 of 142 Phase 1 cores. These tests were performed on an *ad hoc* basis and were not conducted using the standard procedure used during the Phase 2 work.

The locations of the five Phase 1 shake-tested cores are shown in Figure C2-1. The *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 3* (DSR Submittal No. 3; Anchor QEA 2013a) provides more detail on Phase 1 field programs and sample collection methods. Field collection information and Phase 1 visual observations and shake test results for the five Phase 1 shake-tested cores are provided in Section 3. The shake test results and the visual oil observations from the five cores shake tested during Phase 1 were carried forward into the NAPL Evaluation.

2.1.2 Phase 1 USEPA-Identified Cores

USEPA took a broader interpretation of NAPL presence in Phase 1 cores, and identified 18 Phase 1 locations (in 20 cores) where they felt that NAPL may be present (see Figure C2-2), based on the following considerations:

- Phase 1 visual observations
- A comparison of Phase 1 chemical concentrations to benchmark concentrations selected by USEPA for total polycyclic aromatic hydrocarbon (17); total petroleum hydrocarbons; total benzene, toluene, ethylbenzene, and xylene; and total polychlorinated biphenyls
- Proximity to known upland NAPL sites

The DSR Submittal No. 3 (Anchor QEA 2013a) provides more detail on Phase 1 field programs and sample collection methods. The field collection information and Phase 1

visual observations for Phase 1 USEPA-identified cores are provided in Section 3. The 20 Phase 1 USEPA-identified cores were carried forward into the NAPL Evaluation.

2.2 Phase 2 Investigation

Based on the results of Phase 1, USEPA considered the presence and extent of NAPL to be an RI data gap to be addressed during Phase 2 and requested a more rigorous core logging procedure be applied to evaluate and confirm (as needed) the presence of NAPL during Phase 2. Therefore, Phase 1 field methods were modified based on NYSDEC guidance, and a two-part revised Phase 2 field procedure, where visual observations are confirmed using a shake test, was developed.

The locations of cores processed using Phase 2 methods are shown in Figure C2-3. Appendix B to the *Remedial Investigation Report* (RI Report) provides more detail on Phase 2 field programs and sample collection methods. The field collection information, visual observations, and shake test results for cores processed using Phase 2 methods are provided in Section 3. A total of 165 cores processed using Phase 2 methods were carried forward into the NAPL Evaluation, and included the following:

- 19 Phase 1 archive cores processed during Phase 2
- 76 Phase 2 subsurface investigation cores
- 70 Phase 2 groundwater investigation cores

Phase 2 subsurface and groundwater investigations are discussed further in Sections 2.2.2 and 2.2.3.

2.2.1 Phase 2 Field Methods for Describing Visual Observations

The *Phase 2 Field Sampling and Analysis Plan – Volume 2* (Phase 2 FSAP Volume 2; Anchor QEA 2014a) includes the steps for evaluating cores for the presence of NAPL. The process is depicted in Figure C2-4. Upon retrieval, cores were opened, and their properties were documented using standard Unified Soil Classification System procedures (Step 1). Each core was visually examined for the presence of potential NAPL (Step 2). Next, one or more shake tests were performed on each core, by conservatively selecting core intervals with the heaviest visual impacts (Step 3). This involved performing a standardized shake test

on sediment where sheen or NAPL was potentially observed to confirm presence[2]. Where potential NAPL was not observed, one or more depth intervals were chosen for shake tests based on other criteria (e.g., elevated photoionization detector reading, odor, or changes in sediment type). The shake test results were compiled and used to determine whether further evaluation was necessary to support the NAPL delineation (Step 4).

A shake test is a field method for screening sediment where visual observation indicates NAPL is potentially present. As specified in the Phase 2 FSAP Volume 2 (Anchor QEA 2014a), standard amounts of sediment and water were added to a clear 2-ounce polystyrene jar, shaken, and allowed to equilibrate for 10 minutes. The jar and jar contents were observed for the presence of a sheen, NAPL blebs, or a NAPL layer as described in Section 2.2.1.2. Shake test results were logged and photographed and are presented in Section 3.

2.2.1.1 Visual Observations of Potential NAPL

Visual observations of potential NAPL in cores are described in the following terms, consistent with the Phase 2 FSAP Volume 2 (Anchor QEA 2014a):

- No visual evidence of NAPL – No sheen or NAPL is observed.
- Sheen – A sheen is present on a portion of the surface of the sediment; however, NAPL is not observed.
- Blebs – Discrete droplets of NAPL are present, but for the most part, the sediment is not visually contaminated. Typically, this is indicative of residual NAPL.
- Coated – Sediment grains are coated with NAPL. There is not sufficient NAPL present to fully saturate the pore spaces.
- Saturated – The entirety of the sediment pore spaces appear to be filled with NAPL.

Phase 2 visual observation terms are based on NYSDEC Field Descriptions of Samples for Former Manufactured Gas Plant Sites (Kwan 2014a).

[2] Phase 2 shake tests were performed using a standardized method, defined in the Phase 2 FSAP Volume 2 (Anchor QEA 2014a). Phase 1 shake tests were performed outside of the approved work plan process and were not performed using the same standardized method used in Phase 2.

2.2.1.2 Confirmation of Visual Observations by Shake Testing

Visual observations of NAPL in a shake test jar are described in the following terms, as defined in the Phase 2 FSAP Volume 2 (Anchor QEA 2014a):

- Negative – No sheen or NAPL is observed.
- Shake test sheen – A sheen is present on the surface of the water; however, NAPL is not observed.
- Shake test blebs – Discrete droplets of NAPL are present on the sidewalls of the shake test jar, on the water's surface, suspended in the water, or settled on the sediment surface submerged under the water in the jar. The degree of bleb accumulation (see Section 2.2.1.3 for more details) is noted.
- Layer – NAPL appears as a distinct layer within the shake test jar. When possible, the thickness of the NAPL layer is measured. Typically, when a NAPL layer is observed, the shake test jar walls were also coated in NAPL. In those tests, the thickness of the NAPL layer was difficult to distinguish and measure through the coated jar sidewalls.

As shown in Figure C2-4 the observation of sheen only, whether visually observed on sediment or in a shake test, is not considered NAPL.

2.2.1.3 Shake Test Bleb Ranking

Shake test bleb results were used to qualitatively characterize the quantity of NAPL present in the sediment. To characterize the quantity of blebs, shake test bleb observations were assigned a ranking between 1 and 5 based on a visual estimate of the degree of bleb accumulation on shake test jar walls and water surface. If the bleb rank on the shake test jar walls and water surface differed, the higher of the bleb ranks was conservatively recorded as the test outcome. Rank 1 was assigned to shake tests with the least bleb accumulation, and rank 5 was assigned to shake tests with the most bleb accumulation. Figure C2-5 shows representative photographs of each shake test bleb rank associated with graphical depictions of each bleb accumulation rank.

The general behavior of NAPL in a shake test provides a technical basis for the appropriateness of using shake test observations for qualitatively characterizing the quantity of NAPL present in the sediment. The behavior of NAPL in a shake test is summarized in

Section 2.2.1.3.1 and is followed by a description of the process used to develop and assign shake test bleb ranks.

2.2.1.3.1 Behavior of NAPL in a Shake Test

As described in Section 2.2.1 and in the Phase 2 Standard Operating Procedure (SOP) NC 21 – Sediment-Water Shake Test (Anchor QEA 2014b), a shake test consists of placing standard amounts of sediment and distilled water into a 2-ounce polystyrene jar, shaking the jar, and allowing the contents to equilibrate for 10 minutes. The jar contents are observed for the presence of a sheen, NAPL blebs, or a NAPL layer as described in Section 2.2.1.2. Shake test results were logged and photographed. Phase 2 shake test results were photographed under bright light from the top and from the side.

In photographs, shake test blebs typically appear to adhere to shake test jar walls as a flat coating. This allows blebs to be distinguished from three-dimensional objects, such as water droplets or sediment particles, which protrude from the shake test jar wall. The appearance of NAPL and water on the shake test jar walls is due to the material chemistry, described in the following:

- The polystyrene shake test jar consists of nonpolar material.
  - Water is strongly polar, with a surface tension of 72 dynes per centimeter (dynes/cm) at room temperature.
  - Due to this polarity, water is strongly cohesive, so it forms distinct droplets on the shake test jar sidewalls.
- Hydrocarbon NAPL is nonpolar and strongly hydrophobic; the surface tension of gasoline and crude oil ranges from near zero to 34 dynes/cm at room temperature.
  - Because hydrocarbon NAPL is nonpolar, the NAPL and water do not mix, and there is a preference for the NAPL to adhere to the jar walls.
- Due to the low surface tension of hydrocarbon NAPL, spreading will occur and the NAPL will appear as a coating on a nonpolar material, such as the shake test jar walls.

2.2.1.3.2 Bleb Ranking Process

The shake test bleb rank was determined based on a review of the following materials:

- **Core logs** were reviewed for a description of the type of sediment shake tested and for visual observation of sheen, NAPL, or both.
- **Shake test field logs** were reviewed for a description of the shake test result. The shake test field form is considered the best source for shake test observations because field staff worked under bright light, could inspect the shake test jar from multiple angles, and could open the shake test jar to distinguish between sediment, water, and NAPL.
  - The field form consists of check boxes with the following options for shake test results: layer, blebs, sheen, or no observed NAPL.
  - For shake test bleb and layer results, the form includes a field for a description of NAPL color and the degree of NAPL accumulation.
  - Shake test layers were differentiated from blebs based on continuity of the NAPL coating on the water surface. Layers were continuous NAPL on the shake test water surface, while blebs were distinguished as discrete droplets on the shake test water surface and/or jar walls.
- **Photographs of shake test results** were reviewed. Blebs, water droplets, and sediment were identified, and an estimate of the percent accumulation of blebs on jar walls and the water surface was developed using standard comparison charts for visual estimates of percentage abundance from the *Manual of Field Geology* (Compton 1962). Figure C2-5 shows representative photographs of each shake test bleb rank associated with graphical depictions of each bleb accumulation rank from the *Manual of Field Geology* (Compton 1962). The entirety of the visible jar wall was considered when estimating the percentage of the walls covered by blebs.

Shake test water can range in appearance from clear to darkly colored or opaque due to the composition of the sediment shake tested (e.g., silt, clay, sand). Organic and anthropogenic material in sediment can appear as solids floating on the shake test jar contents or adhered to shake test jar walls. Therefore, core log and shake test field log forms were combined to support the interpretation of the shake test photographs. For example, they were both used

to distinguish between sediment and NAPL adhered to the shake test jar, and between reflections and sheen on the surface of the shake test water.

The estimated percent accumulation of blebs was used to assign a bleb rank as follows:

- Shake test bleb coverage 0 to 2% – rank 1
- Shake test bleb coverage 2 to 15% – rank 2
- Shake test bleb coverage 15 to 40% – rank 3
- Shake test bleb coverage 40 to 70% – rank 4
- Shake test bleb coverage greater than 70% – rank 5

The percent estimate ranges (e.g., 0 to 2%, 2 to 15%) are provided in SOP NC-20 – Sediment and Native Material Core Processing (Anchor QEA 2014b) for use in visual estimates. The bleb coverage percentages are also included for reference in Figure C2-5, along with representative photographs of each shake test bleb rank.

To ensure objectivity in determining bleb coverage, the procedure was performed by the same three trained field personnel for all tests. Each individual independently estimated the portion of the jar wall and water surface covered with blebs using standard comparison charts for visual estimates of percentage abundance from the *Manual of Field Geology* (Compton 1962), and the three estimates of percent coverage were then compared. If the bleb percent accumulation estimates were within 20%, the highest estimate was conservatively used to assign a bleb rank. If the bleb percent accumulation estimates varied by more than 20%, each of the three individuals would re-evaluate the core logs, shake test field logs, and photographs of shake test results, and work to develop consensus on the bleb percent accumulation. The consensus percent accumulation estimate was used to assign the shake test bleb rank.

Before assigning final ranks to shake test blebs, the following quality measures were taken to establish consistency in rank estimates across the entire shake test dataset:

- The ranking process was performed after the majority of Phase 2 cores were collected so the dataset could be evaluated as a whole.

- After the initial ranking process had been completed, photographs within each rank were compiled and compared to check for consistency.
- After the initial ranking process had been completed, photographs were compiled and compared between ranks to confirm that increasing ranks consistently reflected increasing quantities of bleb accumulation.

Shake test bleb ranks are one of the criteria considered when evaluating the amount of NAPL in the sediment samples, as discussed in Section 4. Shake test bleb ranks are provided in Section 3.

2.2.2 Subsurface Investigation

Phase 2 subsurface investigation cores were collected using a vibratory core deployed from a vessel. The cores were advanced to a target penetration depth of 20 feet below the sediment surface or refusal, whichever was encountered first. Actual penetration depths and sediment recovery percentages are discussed further in Section 3. One subsurface investigation core, NC295SC-A, was collected using direct-push methods to achieve the target penetration depth. Following recovery, cores were transported to the onshore processing area where they were logged and photographed.

At some stations, multiple collocated cores were collected. The collocated cores were collected from the immediate vicinity of the primary core to provide additional sediment volume needed for laboratory analysis. The core with the greatest recovery was considered the most representative of the sediment composition at each station and was used as the primary core for the sample station. The primary core name was indicated with an "-A" at the end of the core name. The first of the collocated core names was indicated with a "-B," followed by subsequent letters of the alphabet depending on the number of collocated cores collected.

Visual observations and shake test results were recorded for all primary cores collected from 144 stations (76 subsurface investigation stations and 68 groundwater investigation stations) during Phase 2, with the exception of four cores described in Section 2.2.3, for which only visual observations were recorded. Collocated cores generally had visual observations similar

to the primary core, and therefore, visual observations were not recorded, nor were the cores shake tested. When collocated cores differed visually from the primary core, the visual observations of potential NAPL were recorded, and a shake test was performed.

See Appendix B to the RI Report for more detail on field programs and sample collection methods.

2.2.3 Groundwater Investigation

Phase 2 groundwater investigation cores were collected using a direct-push drill rig deployed from a barge. At some locations, a piston core was also used for collection of near-surface sediment due to low recovery of sediment using direct-push sampling. Groundwater investigation cores were advanced to a target penetration depth of at least 8 feet below the native material interface, or refusal, whichever was encountered first. Actual penetration depths and sediment recovery percentages are provided in Section 3; recovery percentages for groundwater investigation cores are typically less than subsurface investigation cores, due to differences in the core collection methods. Groundwater investigation program cores were processed, logged, and photographed on the sampling barge.

During the groundwater investigation program, a single core was collected from each station. The exception is location NC271, where two collocated cores were collected to investigate an "-A" core interval visually characterized as saturated with a bleb shake test result.

Four groundwater cores (EK013SC-A, DK052SC-A, EB049SC-A, and EK098SC-D) were logged for visual observations of potential NAPL using Phase 2 methods and terms; however, the cores were inadvertently not shake tested. The four cores contained no visual evidence of potential NAPL and the deviation from Phase 2 methods was documented in QAPP Deviation Forms 5-3, 5-5, 5-10, and 6-3.

See Appendix B to the RI Report for more detail on field programs and sample collection methods.

2.2.4 Phase 1 Archive Core Processing during Phase 2 Investigation

During Phase 1, collocated cores collected from many Phase 1 sampling locations were collected and archived frozen for potential future use. Based on the results of this NAPL Evaluation described in Section 4, 19 Phase 1 archive cores were retrieved from storage and processed using Phase 2 methods to characterize the presence and extent of NAPL. Phase 1 archive cores processed using Phase 2 methods were selected to supplement NAPL observations in nearby Phase 2 cores. The locations of Phase 1 archive cores processed as part of Phase 2 are shown in Figure C2-6.

2.3 Other Investigations in the Study Area

Historical data from other studies collected outside of the Remedial Investigation/Feasibility Study process were evaluated for data usability to supplement the RI as described in Section 2.2 of the RI Report. The following data have been reviewed and evaluated for use in this NAPL Evaluation:

- Three reports associated with the National Grid Greenpoint Energy Center (DAR No. 32)
  - *Pre-Design Investigation Work Plan – Cutoff Wall Interim Remedial Measure,* January 2009 (GEI Consultants, Inc.[GEI]; 2009a)
  - *Field Sampling Plan*, dated January 2009 (GEI 2009b)
  - *Remedial Investigation Work Plan – Greenpoint Energy Center Former Manufactured Gas Plant Site*, June 2012 (GEI 2012)
- Apollo Street Site – *Remedial Investigation Report for the Greenpoint Apollo Street Creek Parcels*, *Brooklyn, New York,* February 2008 (Ecology and Environment Engineering, Inc. [EEE]; 2008.)
- USEPA – Expanded Site Inspection Report Newtown Creek, July 2009 (Weston 2009)
- Phelps Dodge Refining Corporation Former Laurel Hill Site (DAR No. 16) – *Draft Remedial Investigation Report Operable Unit 6*, May 2007 (Anchor 2007)

A review of these data for quality and appropriateness for use in this NAPL Evaluation is provided in the following subsections.

2.3.1 National Grid Investigations

GEI, on behalf of National Grid, conducted sampling between 2009 and 2010 in the Turning Basin adjacent to the Greenpoint Energy Center Former Manufactured Gas Plant property. Forty-two cores (described in the follow paragraphs) were collected in the Turning Basin at the locations shown in Figure C2-7 (GEI 2009b, 2012).

From 2009 to 2010, GEI collected in-creek[3] sediment data related to an upland investigation in accordance with an NYSDEC-approved *Pre-Design Investigation Work Plan – Cutoff Wall Interim Remedial Measure* (GEI 2009a) and *Supplemental Pre-Design Investigation Work Plan – Cutoff Wall Interim Remedial Measure* (GEI 2010). Five cores collected using rotosonic drilling techniques (GPEC-SB series), and six cores collected using split-spoon drilling techniques (GPEC-GT series), were collected from 50 to 104 feet below the mudline (i.e., the sediment surface) to characterize geotechnical, hydrogeological, and environmental conditions (see Figure C2-7). Field observations during the investigation indicated the presence of NAPL and odors in several of the cores.

In 2010, GEI collected 31 20-foot vibracores (GPEC-SED-series; see Figure C2-7) to further characterize environmental conditions.

The National Grid core collection and logging procedures were reviewed to determine if the National Grid procedures were consistent with the RI NAPL Evaluation procedures and if the data would, therefore, be comparable. Core collection details, sediment lithology descriptions, and detailed observational data for the full length of every National Grid core were reviewed. National Grid visual observations were recorded using the following terms and definitions (GEI 2009b):

- None – absence of NAPL
- Sheen – presence of an iridescent sheen
- Blebs – discrete sphericals of tar/free product, but for the most part, the soil matrix was not visibly contaminated or saturated

[3] The term "creek" is used interchangeably with "Study Area" throughout this NAPL Evaluation.

- Coated – soil grains coated with tar/free product; there is not sufficient free-phase material present to saturate the pore spaces
- Saturated – the entire pore space was saturated with tar/free product

Similar to Phase 2 terms, National Grid terms for visual observations are based on NYSDEC Field Descriptions of Samples for Former Manufactured Gas Plant Sites (Kwan 2014a).

The methods and terms used to classify visual observations during the National Grid investigations are generally consistent with the Phase 2 methods and terms for classifying visual observations and were deemed usable for this RI NAPL Evaluation. However, a subset (approximately 10%) of the National Grid NAPL observations were described using terms not included in the Phase 2 terminology, such as stained, oil, tar, and solid tar, as defined in the Greenpoint Energy Center (DAR No. 32) Field Sampling Plan (GEI 2009b). An experienced geologist reviewed the observations and definitions for transcription to the most similar Phase 2 terms. National Grid logging procedures did not include the use of a shake test to confirm the presence of NAPL. Per the Phase 2 FSAP Volume 2, in the absence of a shake test to confirm presence, National Grid data represent visual observations of potential NAPL and have been carried forward into the NAPL Evaluation. The National Grid data were referenced in the Data Usability Report included in the USEPA-approved Phase 2 FSAP Volume 2 (Anchor QEA 2014a).

2.3.2 Apollo Street Site

EEE, on behalf of NYSDEC, collected cores from Newtown Creek as part of a New York State Superfund RI of the Greenpoint Apollo Street Creek Parcel (Apollo Street Site) in 2007. The primary purpose of this investigation was to evaluate nature and extent of soil and groundwater contamination at the Apollo Street Site and provide the data necessary to develop a remedy selection report designed to improve the recovery of NAPL in the area under the Apollo Street properties. The results of the investigation were also used to assess if the Apollo Street Site conditions posed a potential threat to human health or the environment.

The investigation included 13 cores that penetrated to approximately 8 feet below the mudline, located between creek mile (CM) 1.65 and 1.75, and that were logged for visual observations (EEE 2008). Supporting documentation, including the Apollo Street Site RI report and original field notes, were reviewed. NAPL was not noted at any of the 13 core locations; however, a possible sheen was noted at 1 core location. According to the *Remedial Investigation Report for the Greenpoint Apollo Street Creek Parcels* (EEE 2008), cores were collected for the purpose of laboratory analysis. Due to the lack of a standard field method for describing visual observations, the Apollo Street Site data are not included in this NAPL Evaluation.

2.3.3 USEPA Expanded Site Inspection

USEPA conducted an expanded site inspection (ESI) of Newtown Creek in 2009 as part of the hazard ranking system scoring process that considered the placement of Newtown Creek on the National Priorities List (NPL). Between February and April 2009, cores were collected from 74 locations with penetrations ranging from 3 to 6 feet below the mudline (Weston 2009). The investigation focused primarily on the main stem of Newtown Creek and included Whale Creek and a portion of lower English Kills. The other tributaries (Dutch Kills, Maspeth Creek, East Branch, and upper English Kills) were not investigated.

Visual observation of sheen was noted at 22 core locations, and visual observation of "oil" was noted at 35 other core locations. The exact depths at which visual observations were present and descriptive language beyond "sheen" and "oil" was not provided. A review of field documentation indicates no standard field method for describing visual observations, and documenting the depths at which they occurred. Due to the lack of a standard field method for describing visual observations and uncertainty as to the depths at which the recorded observations were made, the 2009 ESI data are not included in this NAPL Evaluation.

2.3.4 OU-6 Remedial Investigation

The OU-6 RI was conducted in four phases from 2004 to 2005. The RI was performed under the requirements of the July 2002 Order on Consent (D2-0001-02-06) between PDRC and NYSDEC. This RI pre-dated the 2010 inclusion of Newtown Creek on the NPL.

The investigation included 82 cores collected from 45 stations located in Newtown Creek (between CM 1.4 and the confluence with English Kills) and English Kills. Core depths ranged from 3 to 19 feet, with an average core depth of 10 feet (Anchor 2007). The OU-6 RI report and supporting documentation, including the original field notes, were reviewed.

Visual observations described as "NAPL" were noted in 13 cores from 11 stations in Newtown Creek between CM 2.0 and 2.7. Visual observations of sheen were noted in 57 cores from 27 stations in Newtown Creek located between CM 1.4 and 2.8. OU-6 RI NAPL observations are generally located in areas and at depths similar to where NAPL was observed in Phase 2 and National Grid cores; however, descriptive terms beyond "NAPL" were not defined as part of the OU-6 RI work plan (Anchor 2007). Because the OU-6 visual observations lack the detailed descriptive terms used in Phase 2 and National Grid investigations, the OU-6 cores are not included in this NAPL Evaluation.

2.4 Investigation and Data Collection Summary

The cores (and number of cores) that originated from various programs that were carried forward into the NAPL Evaluation are presented in Table C2-1.

3 OBSERVATIONS AND RESULTS

This section presents the results of the NAPL-related investigation activities, including a summary of the field samples collected, sediment types and grain size, and NAPL observations as outlined in Section 2.

Based on a preliminary review of the NAPL observations in Section 3.4, the Study Area was segmented into smaller areas, as described in Section 3.5, to support the more refined and rigorous evaluation of the NAPL observations presented in Section 4.

3.1 Field Sampling Program Details

Field sample data, including sediment lithology types, depth to the native material interface, visual observations, and shake test results, are provided in this section for the following groups of cores:

- 5 Phase 1 shake-tested cores
  - Processed using Phase 1 methods (see Section 2.1)
  - Field information summarized in Table C3-1
  - Core locations shown in Figure C2-1
- 20 Phase 1 USEPA-identified cores
  - Processed using Phase 1 methods (see Section 2.1)
  - Field information summarized in Table C3-1
  - Core locations shown in Figure C2-2
- 151 Phase 2 cores
  - Processed using Phase 2 methods (see Section 2.2)
  - Field information summarized in Table C3-2
  - Core locations shown in Figure C2-3
- 19 Phase 1 archive cores
  - Processed using Phase 2 methods (see Section 2.2)
  - Field information summarized in Table C3-2
  - Core locations shown in Figure C2-6

- 42 National Grid cores (GEI 2009b)
  - Processed using National Grid methods (see Section 2.3.1)
  - Field information summarized in Table C3-3
  - Core locations shown in Figure C2-7

Core-specific field sample information, such as penetration depth, field recovery, and the depth to the native material, are used as lines of evidence in evaluating the nature and extent of NAPL in Section 4.

Phase 1 core logs are located in the *Phase 1 Remedial Investigation Field Program Data Summary Report, Submittal No. 2* (Anchor QEA 2013b). Phase 2 core logs (including the 19 Phase 1 archive cores processed using Phase 2 methods), shake test field forms, and core and shake test photographs are provided in Appendix B to the RI Report. National Grid core logs are located in the *Remedial Investigation Work Plan – Greenpoint Energy Center Former Manufactured Gas Plant Site* (GEI 2012).

3.2 Sediment Lithology

During Phase 1, Phase 2, and National Grid core processing, upon collection of a core, the core was opened, and a description of the sediment type was recorded first, followed by any visual observations. The sediment type and position within the vertical column for intervals where visual observations were noted is used as a line of evidence in the evaluation of NAPL presented in Section 4.

Where present, NAPL is described relative to its position within the sediment column. In the Study Area, the sediment column is composed of sediment overlying native material, and is divided into the following increments, as defined in Section 2.1.3 of the RI Report:

- **Surface sediment** is defined as the deposits within the top 15 centimeters (cm; 6 inches) below the sediment surface (i.e., mudline); surface sediment is the most recently deposited material.
- **Subsurface sediment** is defined as the deposits below surface sediment and above the native material and represents the portion of the sediment column deposited before the surface sediment.

- **Native material** is defined as material deposited prior to the physical influence of humans on the natural environment and consists of the deposits below the sediment.

Sediment is the combination of surface sediment and subsurface sediment. As described in Section 3.1.2 of the RI Report, Study Area sediment is generally a black to gray silt with varying amounts of clay and silt (fine-grained material), sand and gravel (coarse-grained material), and organic and anthropogenic material. The native material is glacial and post-glacial deposits, generally consisting of sand, silt, and clay. The sediment/native material interface was identified in the field by the stark color change between sediment and native material, along with a change in sediment density and grain size.

In Section 4 of the NAPL Evaluation, sediment type is discussed in terms of the percent of the coarse-grained material present. Percent coarse-grained material describes the portion of the sediment composed of sand and gravel (i.e., the sum of sand and gravel percentages, compared to other sediment constituents, such as silt and clay). For example, an interval with 70% coarse-grained material consists of 70% sand or gravel, and 30% silt or clay. The percentages of the different material types were based on field observation.

Sediment type is discussed in terms of the percent of coarse-grained material present because coarse-grained materials are generally more porous and have higher permeability than fine-grained materials. Therefore, coarse-grained sediment has more pore space per unit volume for NAPL to reside within than the same unit volume of finer-grained sediment. In addition, NAPL may have more potential to move within coarse-grained sediment, compared to finer-grained sediment, based on the comparatively higher permeability of coarse-grained sediment.

The sediment composition was recorded on the field core logs as percentages of gravel, sand, silt, and clay. The field-recorded percentages of individual sediment components were used to generate percent coarse-grained material values for the full length of each core. Sediment type, and the location of the sediment/native material interface, is shown on the depth profile and cross-section plots discussed in Sections 4.2 and 4.3.

3.3 NAPL Observations

Phase 1 visual observations and shake test results for the Phase 1 shake-tested cores and Phase 1 USEPA-identified cores are summarized in Table C3-4. Visual observations and shake test results for cores processed using Phase 2 methods (i.e., cores collected during the Phase 2 and archive Phase 1 cores) are summarized in Table C3-5. National Grid visual observations are summarized in Table C3-6.

Information presented in Tables C3-4 through C3-6 includes the following:

- Core ID
- Visual observations of sheen and potential NAPL, and the depth intervals associated with those observations
- Shake test results and the depths at which those shake tests were performed (Tables C3-4 and C3-5 only)

As presented in Tables C3-4 through C3-6, there may have been multiple depth intervals where NAPL was observed in a given core. There may also have been a range of visual observations of potential NAPL, with one or more visual observations confirmed through shake tests. The most notable visual observation and shake test results at a particular core location were used to conservatively represent the spatial extent of NAPL in plan view maps. For example, Phase 2 core EK101SC-A included visual observations at different depth intervals of none, sheen, and saturated (see Table C3-5; additionally, Phase 2 core logs are presented in Appendix B to the RI Report). Shake test results for this core include negative, sheen, and layer (see Table C3-5). The most notable visual observation for core EK101SC-A was conservatively reported as saturated at 8.6 to 9.2 feet. The most notable NAPL shake test result for core EK101SC-A was reported as a layer, also at 8.6 to 9.2 feet.

The most notable visual observation and shake test results for the NAPL Evaluation cores (i.e., Phase 1, Phase 2, and National Grid) are shown in Figure C3-1. Note that National Grid cores were not shake tested, so only the most notable visual observations are shown for National Grid cores. The most notable visual observation and shake test results for cores processed using Phase 1 methods are summarized in Table C3-7. The most notable visual observation and shake test results for cores processed using Phase 2 methods are summarized

in Table C3-8. The most notable visual observation for National Grid cores are summarized in Table C3-9.

By depicting the most notable visual observation and shake test result for each core, regardless of depth, the map concisely presents the observations of NAPL in the Study Area. The most notable shake test results were applied to divide cores into categories (see Section 3.4) and to divide the Study Area into smaller evaluation areas (see Section 3.5) to support a more refined and rigorous evaluation of NAPL in the Study Area.

Examples of visual observations in sediment and in shake test jars are summarized in attachments to Appendix C, as follows:

- Photographs of visual observations of potential sheen, potential NAPL blebs, coated, and saturated visual observations in sediment and in native material are shown in Attachment C-A.
- Photographs of shake test results including negative shake test, sheen, and NAPL blebs and layer results in sediment and native material are shown in Attachment C-B.

The spatial distribution and thickness of NAPL observations in the Study Area are summarized in Sections 3.3.1 through 3.3.3 for surface sediment, subsurface sediment, and native material.

3.3.1 Surface Sediment

NAPL was generally not observed in surface sediment (the top 15 cm [6 inches] of sediment), as indicated by the distribution of visual observations and shake test results shown in Figure C3-2. Sheens were observed at some locations in Newtown Creek and the tributaries. Observations of NAPL (i.e., potential visual observations and shake test results) in surface sediment are limited to 3 of 166 Phase 1 and Phase 2 shake-tested cores, and 6 of 42 National Grid cores (not shake tested; includes all cores with visual observations of blebs, coated, and saturated), summarized as follows:

- Eight cores are located in the southwest corner of the Turning Basin (NC075SC-A, NC298SC-A, GPEC-GT12, GPEC-SED01, GPEC-SED14, GPEC-SED17, GPEC-SED23, and GPEC-SED26)
- One core was located in English Kills (EK100SC-A)

3.3.2 Subsurface Sediment

The most notable visual observations and shake test results in the subsurface sediment are shown in Figure C3-3. Sheens were observed in subsurface sediment throughout Newtown Creek and the tributaries. Blebs were observed in subsurface sediment in the main stem, Maspeth Creek, East Branch, and English Kills. NAPL (i.e., potential visual observations and shake test results) was observed in subsurface sediment in 3 of the 5 Phase 1 shake-tested cores, 58 of the 161 Phase 2 shake-tested cores, and 25 of the 42 National Grid cores (not shake tested; includes all cores with visual observations of blebs, coated, and saturated).

Shake test layer results or coated and saturated visual observations in subsurface sediment were limited to the following three areas (see Figure C3-3):

- CM 1 – 2, where visual observations of coated or saturated, and layer shake test results, were observed in thin sand layers (1 to 3 cm thick, depending on the location) in the subsurface sediment and at the subsurface sediment/native material interface in three cores at CM 1.63 to 1.66. These three cores were collocated with and surrounded by cores that did not contain Category 2/3 NAPL observations.
- CM 2+, where visual observations of coated or saturated, and layer shake test results, were observed in cores located in the west and southwest portions of the Turning Basin. The thickest intervals of visual observations of potential NAPL and positive shake test results in subsurface sediment in this area are limited to the southwest corner of the Turning Basin, where observations range from 0.3 foot to 10 feet thick (a 10-foot thick NAPL observation was noted in cores GPEC-SB111 and GPEC-SB112). National Grid core logs are located in the *Remedial Investigation Work Plan – Greenpoint Energy Center Former Manufactured Gas Plant Site* (GEI 2012) and are shown in Figure 4-74 in the RI Report. Moving downstream along the west perimeter of the Turning Basin, NAPL observations in subsurface sediment decrease

to thicknesses of less than 1 foot and tend to be located at or near the sediment/native material interface.

- **English Kills**, where visual observations of coated or saturated, and layer shake test results, were observed in cores located at the lower bend of English Kills, 1,300 feet upstream from the confluence of Newtown Creek with English Kills. NAPL is generally present in thin (less than 1-foot) intervals. Most of these thin intervals are located at or near the sediment/native material interface, except for one location (EK100SC-A), where visual observations of blebs and positive shake test results were observed in surface and subsurface sediment from the mudline down 3.5 feet to the sediment/native material interface.

3.3.3 Native Material

The most notable visual and NAPL observations in native material are shown in Figure C3-4. Isolated sheens were observed in the native material in the main stem, generally between CM 1.3 and 2.6, and one instance of sheen was observed in the native material in Maspeth Creek. NAPL (i.e., potential visual observations and shake test results) was observed in native material in 1 of the 4 Phase 1 shake-tested cores, 18 of the 122 Phase 2 shake-tested cores, and 16 of the 41 National Grid cores that penetrated into native material (not shake tested; includes all cores with visual observations of blebs, coated, and saturated).

NAPL observations in the native material were generally limited to the same areas of the Turning Basin and English Kills where NAPL was also observed in subsurface sediment.

In CM 2+, visual observations of potential NAPL and positive shake test results were observed at the following two depth intervals within the native material in the Turning Basin:

- The first interval of observations were present at, and within 10 feet of, the sediment/native material interface.
- The second interval of observations were present deeper, separated from the shallower native material observations listed above by 7 to 28.5 feet of native material with no observed NAPL.

In lower English Kills, visual observations of potential NAPL and positive shake test results were observed in the native material from the sediment/native material interface and extending downward, generally 5 feet (Queens side) to 10 feet (Brooklyn side) below the sediment/native material interface (corresponding to 20 feet below the mudline). The majority of NAPL located in English Kills native material was present in thin lenses (from 0.03 foot to 0.8 foot thick) that were generally located in more coarsely grained layers.

3.4 Division of Cores into Categories

As shown in Table C3-10, both visual observations and shake test results (i.e., dual observations) are available for 165 Phase 2 cores. Using Phase 2 methods for describing visual observations, a core can have a most notable visual observation of no visual evidence of potential NAPL, sheen, blebs, coated, or saturated; and a most notable shake test result of negative, sheen, blebs, or layer. Of the 20 potential combinations of visual observations and shake test results, 12 combinations were recorded. Note that Table C3-10 also includes the visual observations and shake test results for the five Phase 1 shake-tested cores. Three combinations of most notable visual and shake test observations were recorded for Phase 1 cores.

A total of 15 different combinations of observations were recorded in shake-tested cores. To aid in data evaluation, cores are sorted into three groups, depending on the classification of visual observations and the shake test results. A flow chart describing the process to identify the magnitude of NAPL observations is presented in Figure C3-5, and the following is a summary of the NAPL observations associated with the group of cores:

- **Category 1A** cores contain no NAPL. Cores with negative or sheen shake test results were assigned to this category (see Table C3-10).
- **Category 1B** cores contain residual NAPL. Cores with bleb shake test results were assigned to this category (see Table C3-10).
- **Category 2/3** cores with shake test layer were assigned to this category (see Table C3-10).
  - Of the 20 cores with layer shake test results, 1 core had a most notable visual observation of blebs. This core was classified as a Category 2 core (see Table C3-10).

- Of the 20 cores with layer shake test results, 15 cores had most notable visual observations of coated or saturated. These cores were classified as Category 3 cores (see Table C3-10).
- Four of the 20 cores with shake test layer results are Phase 1 cores. Two of these cores had most notable visual observations of oil-coated, and two of oil-wetted. These cores were conservatively classified as Category 3 cores (see Table C3-10).
- Based on the nature of the NAPL observations, Category 2 and Category 3 locations were combined and described as Category 2/3 cores.

Category 1A and Category 1B cores were located throughout the Study Area; Category 2/3 cores were concentrated in localized areas in the main stem in CM 1 – 2, CM 2+, and lower English Kills (see Figure C3-6). A similar distribution of visual observations of potential NAPL was observed in cores with visual observations only. Cores with most notable visual observations of coated and saturated were located in CM 2+, in proximity to Category 2/3 cores, and cores with most notable visual observations of blebs or sheen were located throughout the Study Area in proximity to Category 1A and Category 1B cores. In general, visual observation of potential NAPL in sediment was consistent with shake test results (i.e., visual observations that indicated the potential for relatively more NAPL to be present in sediment were verified by shake test results).

For the purpose of this NAPL Evaluation, although National Grid visual observations were not shake test confirmed, National Grid cores with a most notable visual observation of blebs were treated as Category 1B cores, and cores with a most notable visual observation of coated or saturated were treated as Category 2/3 cores. If coated or saturated visual observations of potential NAPL were assumed to be associated with Category 2/3 cores (as generally noted with the Phase 2 cores), 23 out of the 42 National Grid cores would be referred to as Category 2/3 cores. The most notable visual observations for Phase 2 and National Grid cores that do not have shake test results are shown in Figure C3-6.

3.5 Division of Study Area into Evaluation Areas

The Study Area was divided into 14 smaller evaluation areas based on core category distribution. First, two areas where NAPL was not observed, Dutch Kills and Whale Creek,

were identified. The most notable shake test results in Dutch Kills and Whale Creek were sheen. As a result, these areas were assigned as "Category 1A Areas."

Next, portions of the Study Area where residual NAPL was observed (i.e., Category 1B cores) were identified and were divided into nine evaluation areas, referred to as "Category 1B Areas" (see Figure C3-7). The most notable shake test results in Category 1B Areas are blebs, which by definition represent residual NAPL, although there were also numerous cores that were located in Category 1B Areas where NAPL was not observed. Based on the subsequent processing of Phase 1 archive core NC069SC-B in evaluation Area E, as part of the Category 1B process, a shake test layer resulted in core NC069SC-B becoming a Category 2/3 core. Therefore, Area E was adjusted to exclude this Category 2/3 core (see Figure C3-7).

The three remaining portions of the Study Area with Category 2/3 NAPL observations were identified as the following:

- CM 1.7
- Turning Basin
- Lower English Kills

The category of each evaluation area is determined by the core category of the most notable NAPL observations within that area. Table C3-11 indicates the evaluation area location for cores included in the NAPL Evaluation.

4 EVALUATION AND INTERPRETATION

Section 4 evaluates the nature and extent of NAPL. As discussed in Section 3, much of the Study Area contained no NAPL or residual NAPL only (i.e., Category 1B Areas), and three areas were identified as containing Category 2/3 NAPL (i.e., Category 2/3 Areas). To more thoroughly evaluate the nature and extent of NAPL, a stepwise delineation evaluation process was developed.

First, supplementary data (potential upland NAPL sites and physical data as described in Section 4.1) were used as lines of evidence to support NAPL findings. Next, a targeted evaluation was performed on cores with Category 1B NAPL located in areas where only Category 1B NAPL is present (i.e., Category 1B Areas), as described in Section 4.3. The purpose of this targeted evaluation was to confirm that Category 1B NAPL observations in these Category 1B Areas are not associated with a more substantial area of impact. Finally, an evaluation to identify the lateral and vertical limits of the Category 2/3 NAPL observations in the Category 2/3 Areas was performed, as described in Section 4.4.

4.1 Supplementary Data Used in the RI NAPL Evaluation

In addition to NAPL observations and sediment lithology, supplementary datasets were used as lines of evidence in this NAPL Evaluation. Supplementary datasets included a list of potential upland NAPL sites and datasets that describe the physical characteristics of the Study Area (e.g., bathymetry, shoreline). The supplementary datasets used are described in more detail in the following subsections.

4.1.1 Potential Upland NAPL Sites

As described in Section 3.2 of the RI Report, the predominant land use around Newtown Creek and the tributaries (historically through to the present) is industrial, with pockets of mixed-use, commercial, and residential development. Historical industrial operations located around Newtown Creek include adhesives, asphalt, automobile-related, coal, creosote, distillery, electronics, fertilizer, gas, incinerator, metal fabricating, metal scrap and storage, metal smelting, paints and pigments, paper products, petroleum bulk storage, refining, plastics, printing, refuse and recycling, rendering, sugar refining, transportation (e.g., rail yards and ship yards), utilities, and water treatment (see Appendix J of the RI

Report). Today current uses near the creek include the following: warehouse and distribution facilities; vehicle storage and maintenance; electrical distribution; plastics and foil manufacturing; waste transfer yards and recycling facilities; road service support facilities; construction materials storage; facilities that store electrical equipment; scrap metal processing facilities; lumber yards; ready-mix concrete plants; bulk fuel distribution terminals; railroads (e.g., tracks, yards); utilities; and municipal wastewater treatment (Anchor QEA 2014a, 2014b). The DAR (Anchor QEA 2012) and *Addendum to the Data Applicability Report* (DAR Addendum; Anchor QEA 2015) reviewed and evaluated historical documentation from upland areas adjacent to the Study Area to identify potential sources of contaminants to the creek. Identification and evaluation of potential sources is ongoing and the full extent of historical sources may never be known. Upland sites where NAPL may have been historically, or currently, present as part of upland site operations were identified and are summarized in Table C4-1. The list of potential upland NAPL sites may expand to reflect future findings of upland site historical and current conditions. However, sufficient information about potential ongoing sources is available for preparation of this NAPL Evaluation. The locations of potential upland NAPL sites were used as a line of evidence in the evaluation of the presence and extent of NAPL in sediment.

As part of the evaluation and identification of the Phase 1 cores that may contain NAPL (see Section 2.1.2), one of the criteria considered by USEPA was the proximity of cores to potential upland NAPL sites. USEPA identified nine upland sites that they consider a potential historical or current source of NAPL to the Study Area (Kwan 2014b; Battipaglia 2015). USEPA-identified upland sites, with the exception of the Apollo Street Site, were also identified in the DAR and DAR Addendum (Anchor QEA 2012, 2015). USEPA-identified potential upland NAPL sites and the associated DAR identification numbers are summarized in Table C4-1.

Proximity to USEPA-identified potential upland NAPL sites as a line of evidence in the evaluation of the presence and extent of Category 1B NAPL in sediment was considered at the request of USEPA and is presented in Section 4.3. Although the screening of Category 1B NAPL observations relative to USEPA-identified potential upland NAPL sites was performed, it is important to recognize that many factors may be responsible for, or influence, the presence and distribution of NAPL in sediment, including the following:

- Additional upland sites where NAPL may have been transported onto or off of the site, or may have been produced and consumed—the Newtown Creek Group has identified numerous properties, beyond those identified by USEPA, where NAPL products may have been used or produced at one time, in the DAR and DAR Addendum, as shown in Table C4-1
- Point sources, storm drains, and CSOs
- Historical spills/releases to the surface water, most of which are not documented
- Dynamic processes that may mobilize or transport NAPL and sediment, thereby altering properties of NAPL in sediment (e.g., continuity of NAPL layers and obscuring potential NAPL sources)—these include vessel traffic, surface water flow, and navigational dredging

Close proximity between a core with NAPL observations and a potential upland NAPL site does not mean that the site is the source of the NAPL observation; additional lines of evidence were required to assess the potential origins of NAPL.

DAR, DAR Addendum, and USEPA-identified potential upland NAPL sites are shown in Figure C4-1.

4.1.2 Physical Data

Physical data include physical characteristics of the Study Area, including the following:

- Bathymetry
- CSOs and other outfalls, which represent current and historical potential source pathways of NAPL to the Study Area
- Utility crossings
- Shoreline structures (e.g., docks, pipelines, freshwater intakes)
- Booms

The Phase 1 and Phase 2 investigations included numerous surveys conducted to characterize the shoreline surrounding the Study Area and to document the presence of outfalls that discharge to the Study Area. Data collected during Phase 1 were included in three Data Summary Reports that were submitted to USEPA in January, April, and July of 2013

(Anchor QEA 2013a, 2013b, 2013c, respectively). The locations of outfalls and CSOs that discharge to the Study Area are shown in Figure C4-2.

4.2 Category 1A Areas

As described in Section 3.4, Phase 2 cores with no visual observations of potential NAPL were examined to determine if NAPL was observed in the core when shake tested. Cores that did not have NAPL present in the shake tests were classified as Category 1A cores.

There were a total of 97 Category 1A cores; this included 1 Phase 1 shake-tested core. Fifteen of the Category 1A cores were located in the two Category 1A Areas, Dutch Kills and Whale Creek. The remaining 82 Category 1A cores were distributed throughout the Study Area in Category 1B or Category 2/3 Areas. In Dutch Kills, seven of the nine Category 1A cores had sheen observed when shake tested, as shown in plan view in Figure C4-3, and in vertical profile in Figure C4-4. There were six Category 1A cores in Whale Creek, and all cores had sheen present when shake tested, as shown in plan view in Figure C4-5, and in vertical profile in Figure C4-6.

As shown in Figure C2-4, the observation of sheen only, whether visually observed on sediment or in a shake test, was not considered NAPL. Due to the absence of NAPL in Category 1A cores, Category 1A cores were not evaluated further.

4.3 Evaluation of Category 1B Areas

The Category 1B evaluation was a multi-step process for evaluating Phase 2 cores that contained NAPL in amounts less than Category 2/3 cores, and Phase 1 cores that may potentially contain NAPL (i.e., Phase 1 USEPA-identified cores), located in Category 1B Areas. The Category 1B evaluation consisted of the following three steps (see Figure C4-7):

1. **Initial Evaluation**, where cores were screened based on: 1) location relative to USEPA-identified potential upland NAPL sites[4]; and 2) the relative amount of NAPL present in each core. Depending on the outcome of the Initial Evaluation, the

[4] As described in Section 4.1.1, screening of Category 1B cores relative to their location to potential upland NAPL sites was performed at the request of USEPA, so the screening only included upland sites identified as potential upland NAPL sites by USEPA.

Category 1B evaluation for a given core was either complete or the core was carried forward for the next step of the evaluation.

2. **Additional Evaluation**, which consisted of a detailed review of visual and shake test observations and sediment lithology and observations in surrounding cores. Depending on the outcome of the Additional Evaluation, the Category 1B evaluation for a given core was either complete or the core was carried forward for the next step of the evaluation.
3. **Further Evaluation** consisted of collecting additional NAPL data from the area in question, either via the processing of Phase 1 archive cores or the collection of additional Phase 2 cores.

Of the 20 Phase 1 USEPA-identified cores, 17 are located in Category 1B Areas and are included in the Category 1B evaluation, at the request of USEPA. The Phase 1 USEPA-identified cores are evaluated using the Category 1B evaluation process. However, Phase 1 USEPA-identified cores lack visual descriptions and shake tests consistent with the Phase 2 field methods specifically designed to determine NAPL presence, so the cores were evaluated in context of the visual observations and NAPL shake test results in surrounding Phase 2 cores.

Evaluation of cores containing NAPL in Category 1B Areas is provided in the following and summarized in Table C4-2.

4.3.1 Initial Evaluation

The first step in the Category 1B Initial Evaluation was to assess whether a core containing residual NAPL (i.e., a Category 1B core) was located adjacent to a USEPA-identified potential upland NAPL site. A core was considered adjacent to a potential upland NAPL site when positioned between the creek centerline and the upland site. Cores containing Category 1B NAPL and located adjacent to a USEPA-identified potential upland NAPL site were carried forward to the Additional Evaluation (see Figure C4-7 and Section 4.3.2). Cores containing Category 1B NAPL that were not located adjacent to a USEPA-identified potential upland NAPL site moved to the second step of the Initial Evaluation.

The second step in the Initial Evaluation was to screen each core based on the relative amount of NAPL present using the shake test bleb rank (see Section 2.2.1.3). Figure C4-8 shows the highest shake test bleb rank per Category 1B cores. Category 1B cores not located adjacent to a USEPA-identified potential upland NAPL site, but with a shake test rank of 3 or greater, moved forward to the Additional Evaluation (see Section 4.3.2); shake test bleb ranks 1 or 2 represent trace NAPL and did not warrant further evaluation. Thus, for Category 1B cores not located adjacent to a USEPA-identified potential upland NAPL site, and with a shake test rank of less than 3, the Category 1B evaluation was complete and no further evaluation is required (see Figure C4-7).

The Initial Evaluation was performed for a total of 58 cores (41 were Category 1B cores and 17 were Phase 1 USEPA-identified cores) located in Category 1B Areas using the data shown in plan view maps in Figures C4-9a through C4-9i. The results of the Initial Evaluation are summarized in Table C4-3 and are as follows:

- The Category 1B evaluation confirms that residual NAPL observations did not represent a more substantial area of NAPL impacts for 30 Category 1B cores and 13 Phase 1 USEPA-identified cores, out of the 58 cores evaluated.
  - The Category 1B evaluation for these 43 cores is complete.
- Eleven of the Category 1B cores and four Phase 1 USEPA-identified cores evaluated were located adjacent to a potential USEPA-identified potential upland NAPL site and/or had a shake test bleb rank of 3 or higher.
  - These 15 cores were carried forward for the Additional Evaluation (see Section 4.3.2).

4.3.2 Additional Evaluation

As described previously, 15 cores (11 Category 1B and 4 Phase 1 USEPA-identified cores) were carried forward for the Additional Evaluation.

The Additional Evaluation consisted of evaluating NAPL observations in the context of lithology and observations in surrounding cores, to confirm whether Category 1B NAPL was

adequately characterized and that it does not represent a more substantial area of NAPL impacts. Information generally reviewed included the following:

- Visual observations of potential NAPL and shake test results
- The depth at which NAPL was observed
- The thickness of the interval or intervals over which NAPL was observed
- Sediment lithology (color, texture, grain size, and composition)
- Visual observations of potential NAPL, shake test results, and sediment lithology observations in surrounding cores

These data were reviewed together to evaluate whether, based on several lines of evidence, the Category 1B NAPL may represent a more substantial area of NAPL impacts.

For example, a 10-foot-thick interval of visual observations of potential NAPL and corresponding positive shake tests in sediment, surrounded by cores with similar results, may be indicative of a more substantial area of NAPL impacts, and justified Further Evaluation. Conversely, a 0.2-foot interval of visual observations of potential NAPL and corresponding positive shake tests in sediment, surrounded by cores without similar results, does not indicate the presence of a more substantial area of potential NAPL impacts, so Further Evaluation is not warranted. Finally, the presence of a 0.2-foot interval of NAPL in a sand lens at the sediment/native material interface, coupled with a similar result in surrounding cores (depending on the degree of NAPL observed and the relative proximity of the surrounding cores), may be indicative of a more substantial area of NAPL impacts, justifying Further Evaluation. Data for each of the 15 cores considered in the Additional Evaluation were reviewed in this fashion.

The Additional Evaluation was performed for a total of 15 cores (11 were Category 1B cores and 4 were Phase 1 USEPA-identified cores) located in Category 1B Areas based on visual observations and sediment lithology. The locations of these 15 cores are shown in plan view in Figures C4-9a through C4-9i. Vertical profiles are presented in Figures C4-10a through C4-10i. Sediment descriptions from core logs are included in Appendix B of the RI Report. Photographs of core intervals associated with the visual observations and the shake test being evaluated are shown in a photolog in Attachment C-C. The results of the Additional Evaluation are summarized in Table C4-4 and are as follows:

- The Category 1B Additional Evaluation confirms that bleb observations do not represent a more substantial area of NAPL impacts for 8 Category 1B cores and 3 Phase 1 USEPA-identified cores, out of the 15 cores evaluated.
  - The Category 1B evaluation for these 11 cores is complete.
- Three of the Category 1B cores and one Phase 1 USEPA-identified core were identified for Further Evaluation. Because two of the cores (NC069ASC and NC069SC-A) were collected from the same location, only three locations were identified for Further Evaluation.

For the following three Category 1B cores, additional information was needed to complete characterization and confirm that NAPL was not associated with a more substantial area of NAPL impacts, so these cores were carried forward for Further Evaluation:

- NC271SC-A, located in Category 1B Area B
- NC276SC-A, located in Category 1B Area C
- NC069SC-A, located in Category 1B Area E

4.3.3 Further Evaluation

As shown in the schematic in Figure C4-7, Further Evaluation was performed for cores identified during the Additional Evaluation that may contain visual observations or shake test results that are not fully characterized, or that may be associated with a more substantial area of potential NAPL impacts. Further Evaluation consisted of collecting additional characterization information and processing nearby Phase 1 archive cores using Phase 2 methods.

Results of the Further Evaluation are summarized in Table C4-5 and discussed in the following subsections.

4.3.3.1 Area B

Observations in Category 1B core NC271SC-A and Phase 1 USEPA-identified core NC022CSC (see Figures C4-10b and C4-9b) suggested that the NAPL observed at NC271SC-A may not be limited to this location. NC271SC-A contained a visually saturated interval

located in a 6-cm-thick sand lens at the sediment/native material interface. The corresponding shake test resulted in rank 2 blebs. Adjacent core NC022CSC contained Phase 1 visual observations of oil wetting above the sediment/native material interface. Further Evaluation was needed to evaluate the extent of NAPL observed at the sediment/native material interface in NC271SC-A.

Two additional Phase 2 cores were collected (NC271SC-B and NC271SC-C), and two Phase 1 archive cores were processed using Phase 2 methods (NC022SC-B and NC023SC-B); the archive cores were collected from Phase 1 USEPA-identified locations NC023 and NC022 (see Figure C2-2). As shown in Figures C4-9b and C4-10b, shake test results for NC271SC-B were negative; the most notable shake test result for NC271SC-C was rank 2 blebs. These cores did not penetrate to the elevation of the saturated coarse-grained lens observed at NC271SC-A; however, the two nearby Phase 1 archive cores did achieve this depth.

Archive cores NC022SC-B and NC023SC-B were processed using Phase 2 methods. The most notable shake test result for NC022SC-B was rank 3 blebs, observed in silt in an interval that extends down to the sediment/native material interface. However, the sand lens at the sediment/native material interface was not present in NC022SC-B (see Figure C4-10b). The most notable shake test result for NC023SC-B was rank 2 blebs. The sand lens was observed in NC023SC-B and did not contain NAPL (see Figure C4-10b). The NAPL results from the four cores processed to evaluate Area B further are summarized in Table C4-5.

The additional cores processed to evaluate NAPL observed at NC271SC-A provided sufficient characterization of NAPL in this area. Furthermore, the residual observations of NAPL and sediment lithology in NC022SC-B and NC023SC-B confirmed that the NAPL observed in the sand lens at NC271SC-A was localized and not associated with a more substantial area of NAPL impacts. Therefore, the Category 1B evaluation in Area B was completed with no further action required.

4.3.3.2 Area C

Observations in Category 1B core NC276SC-A and adjacent Phase 1 USEPA-identified core NC036CSC (see Figures C4-10c and C4-9c) suggest that NAPL observed in NC276SC-A may

not be limited to this location. NC276SC-A, located adjacent to a USEPA-identified upland NAPL site, contained an interval of silt with visual sheen with a shake test result of blebs (rank 3) at 2.6 feet. The visual observation and lithology of sediment associated with the rank 3 shake test were similar to observations in the overlying sediment, meaning that the rank 3 shake test could be representative of conditions in the overlying surface and near-surface sediment. Further Evaluation was performed to evaluate the extent of NAPL present in surface and near-surface sediment.

Further Evaluation in Area C consisted of processing Phase 1 archive core NC036SC-A using Phase 2 methods; the archive core was collected from Phase 1 USEPA-identified location NC036. NC036SC-A is located approximately 20 feet from NC276SC-A (see Figure C4-9c). NAPL was not observed at any depth in NC036SC-A; the most notable visual and shake test observations were of sheen, which was present from 0.8 foot to the sediment/native material interface at 3.3 feet. NC036SC-A results are summarized in Table C4-5 and are shown in Figures C4-9c and C4-10c.

The lack of NAPL observed in NC036SC-A confirms that the NAPL observed at NC276SC-A is localized and is not associated with a more substantial area of NAPL impacts. Therefore, the Category 1B evaluation in Area C was completed with no further action required.

4.3.3.3 Area E

Category 1B core NC069SC-A contained rank 4 shake test blebs in a sand lens located at the sediment/native material interface. The following results in surrounding cores (see Figures C4-9e and C4-10f) suggest that the NAPL observed in NC036SC-A may not be limited to NC036SC-A:

- Visual observation of oil wetting was observed at the sediment/native material interface in the adjacent Phase 1 USEPA-identified core NC069ASC.
- Potential NAPL was visually observed in nearby National Grid core GPEC-SED20: blebs were visually observed in sediment immediately above the sediment/native material interface, and native material immediately below the sediment/native material interface was visually saturated.

Phase 1 archive core NC069SC-B was processed using Phase 2 methods to characterize the nature of impacts associated with the oil-wetted visual observation in Phase 1 core NC069ASC and to further evaluate potential NAPL observed in NC069SC-A. A sand layer located immediately below the sediment/native material interface was visually coated and had a corresponding shake test layer result, consistent with visual observations of potential NAPL at NC069SC-A and GPEC-SED20. Based on the shake test result (layer) and visual observation (coating), NC069SC-B is classified as a Category 2/3 core, and Area E has been adjusted to exclude this core. Thus, as indicated in Table C4-5, the excluded portion of Area E was carried forward into the next step of the evaluation process and included in the Turning Basin Category 2/3 evaluation as discussed in Section 4.4.

4.4 Evaluation of Category 2/3 Areas

The purpose of the Category 2/3 evaluation was to characterize the presence and extent (lateral and vertical limits) of NAPL in the following three areas where Category 2/3 NAPL was observed:

- CM 1.7 Category 2/3 Area (see Figure C4-11 and Figures C4-12a through C4-12c)
- Turning Basin Category 2/3 Area (see Figure C4-13 and Figures C4-14a through C4-14e)
- Lower English Kills Category 2/3 Area (see Figure C4-15 and Figures C4-16a through C4-16d)

The locations of the Category 2/3 Areas are shown in Figure C3-6.

The Category 2/3 evaluation process is described in the following paragraphs and shown in Figure C4-17.

Step 1 – Identify the presence of Category 2/3 NAPL observations and collect additional information. In Step 1, the presence of Category 2/3 NAPL observations in sediment, at the sediment/native material interface, and in the native material was identified. Category 2/3 core observations included visual observations of coated or saturated, and shake test layer results. The need for additional characterization of Category 2/3 NAPL observations was determined based on a review of visual observations, shake test results, and sediment

lithology. Additional characterization consisted of processing Phase 1 archive cores or collecting additional Phase 2 cores.

Step 2 – Characterize the extent of Category 2/3 NAPL observations. In Step 2, the lateral and vertical limits of Category 2/3 NAPL observations were identified using the following lines of information:

- Cores or intervals where NAPL was not present or unlikely, based on shake test results and visual observations of potential NAPL
- Cores or intervals where residual NAPL was present or likely, based on shake test results and visual observations of potential NAPL
- Sediment lithology
- Physical barriers, such as underground pipelines and utility crossings

The lateral limit of Category 2/3 NAPL observations was defined by one of the following four possible conditions:

- The nearest core or cores with residual NAPL (i.e., visual observations or shake test results of blebs) or no NAPL, at the same elevation, or in the same lithology type (e.g., a distinct sand lens), where Category 2/3 NAPL observations were present
- The terminus of a specific lithology type (e.g., a distinct sand lens) where Category 2/3 NAPL observations were present
- A physical barrier beyond which cores contain only residual NAPL or no NAPL
- The upland shoreline

Step 2 of the Category 2/3 evaluation completes the RI characterization of the presence and extent of NAPL.

Evaluation of each of the three Category 2/3 Areas is provided in Sections 4.4.1 through 4.4.3.

4.4.1 CM 1.7 Area

4.4.1.1 Step 1 – Identify the Presence of Category 2/3 NAPL Observations and Collect Additional Information

Category 2/3 NAPL observations were present in three CM 1.7 cores, where the NAPL was observed in a thin, discontinuous sand layer that ranged from 1 to 3 cm thick. In NC050ASC and NC262SC-A, located adjacent to the Queens shoreline, the sand layer containing Category 2/3 NAPL observations was located at the sediment/native material interface. At NC048CSC, located adjacent to the Brooklyn shoreline, Category 2/3 NAPL was observed in a sand layer located approximately 2 feet above the sediment/native material interface. Visual and shake test observations in the three Category 2/3 core are as follows:

- NC050ASC, a Phase 1 shake-tested core with oil coating visually observed in a 1-cm-thick sand layer at the sediment/native material interface, 8.0 feet below the sediment surface. A yellow coating was observed on the sample spoon during core processing. Phase 1 shake testing produced a layer result. This core is also a Phase 1 USEPA-identified core.
- NC262SC-A, a Phase 2 core where visual blebs and a corresponding shake test layer result were observed in a 3-cm sand layer at the sediment/native material interface, 6.4 feet below the sediment surface. This is the only Phase 2 core where a visual observation of blebs corresponded to a shake test layer result.
- NC048CSC, a Phase 1 shake-tested core with oil coating visually observed in a 1-cm-thick sand layer in sediment, 6.3 feet below the sediment surface. A yellow coating was observed on the sample spoon during core processing. Phase 1 shake testing produced a layer result. This core is also a Phase 1 USEPA-identified core.

The most notable visual observations of potential NAPL and shake test results in CM 1.7 cores are shown in plan view in Figure C4-11. Visual observations, shake test results, and sediment lithology are shown for the full length of each core in cross-section in Figures C4-12a through C4-12c. Cross-section locations are shown in Figure C4-11.

Based on a preliminary review of Category 2/3 NAPL observations in sediment and native material, the need for additional information to further characterize the lateral limit of Category 2/3 observations was identified. Seven Phase 1 archive cores were selected for

processing using Phase 2 methods. Table C4-6 identifies the Phase 1 archive cores processed to provide additional characterization of lateral and vertical limits of Category 2/3 observations, the rationale for processing each core, and the results of the core processing.

4.4.1.2 Step 2 – Characterize the Extent of Category 2/3 NAPL Observations

CM 1.7 Category 2/3 NAPL observations were limited to 1- to 3-cm sand layers located in sediment near or at the sediment/native material interface and are overlain by 6.3 to 8.0 feet of sediment with no or residual NAPL. Cross-sections 1 through 3 (see Figures C4-12a through C4-12c) show that the sand layer associated with the Category 2/3 observations is discontinuous and limited in extent. Category 2/3 observations were bound laterally by upstream and downstream cores and vertically by underlying sediment with no NAPL observation within the same core. A detailed description of the interpretation of the boundaries of the Category 2/3 observations in CM 1.7 is provided in the following.

Cross-section 1 extends from west to east along the Queens shoreline of Newtown Creek (see Figure C4-12a). Category 2/3 NAPL observations were present in two cores (NC050ASC and NC262SC-A; see Figure C4-12a). Because NAPL was not observed in NC281SC-A, located between NC050ASC and NC262SC-A, and NC050SC-B, collocated with NC050ASC, the sand layer where Category 2/3 NAPL observations were located appears to be discontinuous and limited in extent. Category 2/3 observations on cross-section 1 (see Figure C4-12a) are laterally bound downstream by NC279SC-A, where the sand layer at the sediment/native material interface was observed and upstream by NC056SC-A. Category 2/3 NAPL observations are vertically bound by underlying sediment, with no observation of NAPL within the same core.

Cross-section 2 extends from the Brooklyn shoreline to the Queens shoreline (south to north) across the creek (see Figure C4-12b). Category 2/3 NAPL observations were present in two Phase 1 cores (NC048CSC and NC050ASC; see Figure C4-12b). Category 2/3 NAPL observations were not present in either of the collocated Phase 1 archive cores processed using Phase 2 methods (see Figure C4-12b). Visual blebs with a maximum result of rank 3 shake test blebs were observed in NC048SC-E, and visual and shake test sheen were observed in NC050SC-B. Differences in observations in collocated cores indicate that the lateral

extent of Category 2/3 NAPL in this area is limited. Category 2/3 NAPL observations are vertically bound by underlying sediment, with no observation of NAPL within the same core.

Cross-section 3 extends from west to east along the Brooklyn shoreline of Newtown Creek (see Figure C4-12c). Category 2/3 NAPL observations were present in one Phase 1 core, NC048CSC. The collocated core, NC048SC-E, processed using Phase 2 methods, contained visual blebs with a maximum shake test result of rank 3 blebs. Because the sand layer and associated Category 2/3 NAPL observations in NC048CSC were not observed in either the collocated core, or in upstream and downstream cores, the sand layer and associated Category 2/3 NAPL observations appear to be discontinuous and limited in extent. Category 2/3 NAPL observations are bound laterally downstream by NC045SC-A and upstream by NC051SC-B. NAPL is not observed in the native material in any of the cores on cross-section 3, and each core generally has several feet of sediment recovered below the deepest NAPL observation, providing a limit to the vertical extent of NAPL.

As a result of this evaluation, the upstream boundary of the CM 1.7 Category 2/3 Area was adjusted, based on the absence of Category 2/3 NAPL observation in adjacent Phase 1 cores that provided a clear boundary. This resulted in the Category 1B CM 2.2 Area boundary being extended downstream from its original location.

4.4.2 Turning Basin Area

4.4.2.1 Step 1 – Identify the Presence of Category 2/3 NAPL Observations and Collect Additional Information

The most notable visual observations of potential NAPL and shake test results in Turning Basin cores are shown in plan view in Figure C4-13. Visual observations, shake test results, and sediment lithology are shown for the full length of each core in cross-section in Figures C4-14a through C4-14e. Cross-section locations are shown in Figure C4-13.

As seen in cross-section, NAPL in the Turning Basin is observed in the sediment and in the following two intervals within the native material:

- At, and within 10 feet of, the sediment/native material interface
- At depth, separated from the shallower native material observations listed above by 7 to 28.5 feet of native material with no observed NAPL (see Figures C4-14a, C4-14b, C4-14d, and C4-14e)

The majority of Category 2/3 NAPL observations in the Turning Basin Area are limited to cores located in the west and southwest portions of the Turning Basin (see Figure C4-14a). The thickest intervals of Category 2/3 observations in subsurface sediment in this area are limited to the southwest corner of the Turning Basin, where observations range from 0.3 foot (10 cm) to 9 feet thick (see Figures C4-14a through C4-14e). Visual observations of potential NAPL coated and saturated native material is observed at depth in three cores in the most southwestern corner of the Turning Basin (GPEC-GT12, GPEC-SB110, and GPEC-SB112; see Figures C4-13 and C4-14a).

Moving downstream along the west perimeter of the Turning Basin, Category 2/3 observations in sediment decrease to thicknesses of less than 1 foot and tend to be located at or near the sediment/native material interface (see Figure C4-14a).

Based on a preliminary review of Category 2/3 observations in sediment and native material, the need to further evaluate the potential for NAPL in Phase 1 USEPA-identified cores was determined. Three Phase 1 archive cores were identified for processing using Phase 2 methods. The Phase 1 archive cores processed, the rationale for processing, and the results of the core processing are summarized in Table C4-6.

As described in Section 4.3.3.3, Phase 1 archive core NC069SC-B was processed to support the Category 1B Area E evaluation. Category 2/3 NAPL observations in NC069SC-B (and thus, Area E) were included in the Turning Basin Category 2/3 evaluation (see Figures C4-14a and C4-14b).

4.4.2.2 Step 2 – Characterize the Extent of Category 2/3 NAPL Observations

A detailed description of the interpretation of the boundaries of Turning Basin Category 2/3 NAPL observations is provided in this subsection.

Cross-section 1 extends from north to south along the Brooklyn shoreline of Newtown Creek (see Figure C4-14a).

Laterally discontinuous potential NAPL and NAPL is observed in surface and near-surface sediment at the south (upstream) end of cross-section 1 in NC075SC-A (shake test bleb rank 5), NC298SC-A (visually coated, shake test layer), and GPEC-GT12 (visual blebs). The upstream lateral limit of Category 2/3 NAPL in surface and near-surface sediment is provided by GPEC-SED03, where no visual evidence of potential NAPL was observed. The downstream lateral limit is provided by GPEC-SB112, where no visual evidence of potential NAPL was observed.

At the northwest (downstream) end of cross-section 1, Category 2/3 observations are present in thin, discontinuous, coarse-grained sand lenses approximately 2 cm to 3.6 feet thick located at, and within 3.5 feet of, the sediment/native material interface (GPEC-GT20, NC069SC-B, and NC069SC-A; see Figure C4-14a). The downstream lateral limit of Category 2/3 observations was provided by GPEC-SED22. Category 2/3 observations at and near the sediment/native material interface continued upstream along cross-section 1 to the shoreline. Category 2/3 observations at and near the sediment/native material interface were vertically bound by underlying sediment or by adjacent cores with deeper penetration, where NAPL was not observed.

At the southwest (upstream) end of cross-section 1, Category 2/3 NAPL was observed at depth in the native material in cores GPEC-SB112, GPEC-SB110, and GPEC-GT12. Between cores at depth, the Category 2/3 observations are discontinuous; cores GPEC-GT14 and GPEC-SB111 penetrated to similar elevations, but no visual evidence of potential NAPL was observed (see Figure C4-14a). The Category 2/3 observations at depth in native material were bound laterally in the downstream direction by GPEC-GT16 and in the upstream direction by the shoreline. Category 2/3 NAPL observations at depth in native material were vertically bound by underlying native material or by adjacent cores with deeper penetration, where no visual evidence of potential NAPL was observed.

Cross-section 2 extends across the Turning Basin, from the Brooklyn shoreline to the Queens shoreline (west to east; see Figure C4-14b). Category 2/3 NAPL observations on

cross-section 2 are located in thin (2 to 4 cm) sand lenses near the sediment/native material interface and are limited to cores located adjacent to the Brooklyn shoreline. Category 2/3 NAPL observations are bounded vertically in each of the cores by underlying sediment where NAPL was not observed and by adjacent core GPEC-SB113, which penetrated to more than 125 feet below the mudline. GPEC-SB113 also provided a lateral limit of Category 2/3 observations in this area. As shown in cross-section 1, Category 2/3 observations on cross-section 2 were bound downstream in the Turning Basin by GPEC-GT22 and GPEC-SED22 (see Figures C4-15 and C4-14a). Category 2/3 NAPL observations extended upstream of cross-section 2; the horizontal extent of these observations in the upstream direction is shown in cross-section 1.

Cross-section 3 extends across the Turning Basin, from the Brooklyn shoreline to the Queens shoreline (west to east; see Figure C4-14c). Category 2/3 NAPL observations on cross-section 3 extend approximately 320 feet from the Brooklyn shoreline out toward the center of the creek and were located at, and across, the sediment/native material interface, beneath approximately 5 to 7 feet of sediment with residual NAPL or no NAPL observations. Category 2/3 NAPL observations consisted of visually coated observations ranging in thickness from 2 to 5 feet. Variability in the distribution of visual observations relative to sediment lithology (grain size) and native material interface elevations suggest that the observations are laterally discontinuous. The lateral limit of Category 2/3 observations is defined by the Brooklyn shoreline to the west and by cores with no NAPL at, and near, the sediment/native material interface to the east (NC218SC-A, NC233SC-B, and NC233SC-A; see Figure C4-14c). Category 2/3 observations were vertically bound by underlying sediment where no visual evidence of NAPL was observed in the core itself or in adjacent cores.

At GPEC-SED14, 0.3 foot of visual blebs was observed in sediment 0.3 foot below the mudline. No visual evidence of potential NAPL was observed in surface or near-surface sediment in adjacent cores (GPEC-SED15 and GPEC-SED13; see Figure C4-14c). Therefore, Category 2/3 observations in surface or near-surface sediment were limited in lateral extent.

Cross-section 4 spans the Turning Basin, from the Brooklyn shoreline to the Queens shoreline (west to east; see Figure C4-14d). Category 2/3 NAPL observations on cross-section 4 extend approximately 260 feet from the Brooklyn shoreline out toward the

center of the creek and were typically observed in coarser-grained sediment (e.g., sand) at the following two depth intervals:

- In the majority of cores with Category 2/3 observations, 2.8 to 9.8 feet of Category 2/3 NAPL observations were present at, and within approximately 10 feet of, the sediment/native material interface
- In one core, GPEC-SB112, 17 feet of Category 2/3 NAPL were observed at depth, separated from the shallower Category 2/3 visual observations by 13 feet of native material with no visual evidence of potential NAPL

Category 2/3 NAPL observations at, and near, the sediment/native material interface were vertically bound by underlying sediment, where no visual evidence of potential NAPL was observed in the core itself or in adjacent cores. In GPEC-SB112, visually saturated observations at and near the sediment/native material interface were vertically bound by the 9.5 feet of native material, separating observations at and near the sediment/native material interface from visually coated and saturated observations present at depth (see Figure C4-14d). Category 2/3 NAPL observations were laterally bound by core GPEC-SED26, which had no visual evidence of potential NAPL and penetrated 2.5 feet into the native material.

Category 2/3 NAPL observations at depth in the native material at GPEC-SB112 were vertically bound by the underlying sediment where no visual evidence of potential NAPL was observed. Category 2/3 NAPL observations were limited in lateral extent to the north, based on no visual evidence of potential NAPL in core GPEC-SB111, located approximately 90 feet south of GPEC-SB112 (see Figure C4-13). Category 2/3 observations at GPEC-SB112 were bound by the Brooklyn shoreline on the west but are not bounded to the east.

At NC075SC-A, visual blebs, with corresponding shake test blebs (rank 5 at 4.2 feet, and rank 2 at 6.9 feet), were observed in silty sediment, starting at the mudline and extending 10 feet downward. Approximately 280 feet east of NC075SC-A, 3.5 feet of visual observation of blebs were encountered in surface and near-surface sediment silt at GPEC-SED26. Observations of NAPL in surface and near-surface sediment were separated by two cores with no visual evidence of potential NAPL in surface and near-surface sediment; no visual evidence of potential NAPL was observed in surface and near-surface sediment in cores

located shoreward of NC075SC-A (GPEC-SB111, GPEC-SB112, and GPEC-GT14; see Figure C4-13). Therefore, the presence of NAPL in surface or near-surface sediment was limited in lateral extent.

Cross-section 5 spans the Turning Basin, running from the Brooklyn shoreline to the Queens shoreline (west to east; see Figure C4-14e). Similar to Category 2/3 NAPL observations in cross-section 4, Category 2/3 observations were located as follows:

- At the surface and near-surface
- At, and within approximately 6 feet of, the sediment/native material interface
- At depth, separated from the shallower native material observations by more than 15 feet of native material with no visual evidence of potential NAPL

Visual observations of NAPL and potential NAPL were present in surface and near-surface sediment in four cores (GPEC-GT12, NC298SC-A, GPEC-SED01, and NC309SC-C; see Figure C4-14e). Category 2/3 NAPL observations were present in surface and near-surface sediment only at NC298SC-A, starting at the mudline and extending 6.5 feet into the sediment. Cores with visual observations of potential NAPL and positive shake tests in surface and near-surface sediment are separated by cores with no visual evidence of potential NAPL. This indicates that NAPL observations in surface and near-surface sediment were discontinuous and limited in extent.

Category 2/3 NAPL observations present at, and near, the sediment/native material interface were observed in four cores located in the western portion of cross-section 5 (GPEC-GT12, GPEC-SB110, NC298SC-A, and GPEC-SED02; see Figure C4-14e). The sediment lithology where the NAPL observations were present varied, from coarse-grained native material in cores closest to the Brooklyn shoreline, to fine-grained sediment in cores located to the east, indicating Category 2/3 NAPL was localized and discontinuous (see Figure C4-14e). Category 2/3 NAPL observations are vertically bound by underlying sediment where NAPL was not observed in the core. In GPEC-GT12 and GPEC-SB110, visual observations at and near the sediment/native material interface were vertically bound by more than 15 feet of native material separating these observations from the visual observations at depth (see Figure C4-14e). Category 2/3 observations at, and near, the sediment/native material

interface and located adjacent to the shoreline were laterally bound to the east by GPEC-SED01, which penetrated approximately 4 feet into the native material.

Category 2/3 NAPL observations were present at depth in the native material in two cores adjacent to the Brooklyn shoreline (GPEC-GT12 and GPEC-SB110). In both cores, Category 2/3 observations were present in coarse-grained native material. However, the elevations of the Category 2/3 observations differ by approximately 10 feet, indicating that the Category 2/3 NAPL observations are discontinuous. Category 2/3 observations in both cores were vertically bound by the underlying sediment with no visual evidence of potential NAPL. Category 2/3 NAPL observations at depth in the native material and located adjacent to the shoreline were not laterally bounded to the east. However, given the depth of the Category 2/3 NAPL observations 35 to 50 feet below the mudline, and because the lateral limits of Category 2/3 NAPL in the overlying sediment and overlying native material were delineated, characterization of the horizontal extent of Category 2/3 NAPL in this area is complete for the purposes of the RI evaluation.

4.4.3 Lower English Kills Area

4.4.3.1 Step 1 – Identify the Presence of Category 2/3 NAPL Observations and Collect Additional Information

The most notable visual observations of potential NAPL and shake test results in English Kills cores are shown in plan view in Figure C4-15. Visual observations, shake test results, and sediment lithology are shown for the full length of each core in cross-section in Figures C4-16a through C4-16d. Cross-section locations are shown in Figure C4-15.

Category 2/3 NAPL observations were observed in 13 English Kills cores (see Figure C4-15), where the majority of Category 2/3 NAPL observations are located in native material sand layers. The upstream-most core with Category 2/3 NAPL observations is EK080SC-A, where a 3-cm visually saturated sand layer with a corresponding shake test layer result was located 14 feet below the sediment surface in native material (see Figure C4-16a).

Moving downstream, Category 2/3 NAPL observations were present in a number of cores clustered just downstream of the bend that defines the lower reach of English Kills. On the

Brooklyn side of the channel, Category 2/3 NAPL observations were present in the following cores (see Figure C4-16c):

- **EK004SC-B**, where a visually coated 9-cm interval and a visually saturated 24-cm interval of gravelly sand were observed in native material at the bottom of the core, starting at 16.2 feet below the sediment surface.
- **EK004ASC** is a Phase 1 shake-tested core that is collocated with EK004SC-B. Oil wetting was observed in gravelly sand native material at the bottom of the core. A yellow coating was observed on the sample spoon during core processing. Phase 1 shake testing produced a layer result.
- **EK100SC-A**, where 1- to 10-cm sand layers located in beds of medium sand native material were visually coated or saturated and had corresponding shake test layer results.
- **EK101SC-A**, where an 18-cm visually saturated interval was located at the bottom of a sand bed in native material, with a corresponding shake test layer result.
- **EK093SC-A**, where a 1-cm sand layer in sediment located 3.9 feet below the sediment surface was visually saturated. In the center of the channel, **EK006SC-D** contained a 7.5-cm visually coated sand layer, and a corresponding shake test layer result, in sediment located 3.5 feet below the sediment surface at the bottom of the core (see Figure C4-16a).

On the Queens side of the channel, Category 2/3 NAPL observations were present in the following cores (see Figure C4-16c):

- **EK005SC-A**, where 18-cm and 6-cm visually coated sand layers were observed in the native material. The 18-cm visually coated interval had a corresponding shake test layer result.
- **EK005BSC** was a Phase 1 shake-tested core that was collocated with EK005SC-A. Oil wetting was observed in sand, starting at 7 feet in sediment, and extended into the native material down to 11.8 feet. A yellow coating was observed on the sample spoon during core processing. Phase 1 shake testing produced a layer result.
- **EK094SC-A**, where a 15-cm sand layer in the native material was visually saturated and had a corresponding shake test layer result.

- **EK104SC-A**, where a 1.5-cm visually saturated sand layer with a corresponding shake test layer result was observed at the sediment/native material interface. Below this, two thin sand layers (3 cm and 0.25 cm) located in the native material were also visually saturated, with corresponding shake test layer results.
- **EK103SC-A**, a Phase 2 core with visually coated and saturated 0.2- to 7-cm sand layers and corresponding positive shake test layer results in native material, 3.9 to 6.7 feet below the sediment surface.

The downstream-most core with Category 2/3 NAPL observations was EK003SC-B, where a 5-cm sand layer located at the bottom of the core in the native material was visually coated and had a corresponding shake test layer result (see Figure C4-16d).

Following a preliminary evaluation of Category 2/3 NAPL observations in sediment and native material, Phase 1 archive cores EK007SC-B and EK008SC-B, collocated with USEPA Phase 1-identified cores, were selected for processing using Phase 2 methods. The cores were selected to better characterize the extent of the Category 2/3 NAPL observation in the native material in EK080SC-A (3-cm-thick sand layer 14 feet below the sediment surface). As discussed below, NAPL was not observed in either archive core processed using Phase 2 methods. Table C4-6 identifies the Phase 1 archive cores processed to provide additional characterization of lateral limits of Category 2/3 NAPL observations, the rationale for processing each core, and the results of the core processing.

4.4.3.2 Step 2 – Characterize the Extent of Category 2/3 NAPL Observations

As seen in cross-section, English Kills Category 2/3 NAPL observations are located in various discrete sand layers in native material and were overlain by 5 to 16 feet of sediment with residual NAPL or no NAPL observed, with the exception of cores EK104SC-A and EK006SC-D (see Figures C4-16a through C4-16d). At EK104SC-A and EK006SC-D, Category 2/3 NAPL observations were present in sand layers located immediately above the sediment/native material interface. Category 2/3 NAPL observations in sediment and the native material were bound laterally by upstream and downstream cores. In some cores, the vertical extent of Category 2/3 NAPL observations was bound by underlying sediment, with no observation of NAPL within the same core or adjacent cores. The vertical extent of

Category 2/3 NAPL observations in the native material in cores EK004SC-B, EK004ASC, EK100SC-A, and EK101SC-A extended to at least -30 feet North American Vertical Datum of 1988 (NAVD88), and may extend deeper. A detailed description of the interpretation of the boundaries of English Kills Category 2/3 NAPL observations is provided in the following.

Cross-section 1 extends parallel to the shoreline, from upstream to downstream (see Figure C4-16a). Category 2/3 NAPL observations were present in two cores, in the native material at EK080SC-A, and in sediment at EK006SC-D. The lack of Category 2/3 NAPL observations in cores adjacent to EK080SC-A and EK006SC-D indicates the Category 2/3 NAPL observations in EK080SC-A and EK006SC-D are discontinuous and limited in lateral extent.

Category 2/3 NAPL observations in the native material at EK080SC-A were bound laterally in the upstream direction by EK007SC-B and EK008SC-B; both cores penetrated to a similar elevation as EK080SC-A but did not contain NAPL observations. In the downstream direction, the lateral limit of Category 2/3 NAPL observations were bound by EK079SC-A. Although EK036SC-A penetrated deeper than EK080SC-A, sediment was not recovered from the elevation where Category 2/3 NAPL was observed (see Figure C4-16a), and EK079SC-A was conservatively used as the lateral downstream boundary. In EK080SC-A, Category 2/3 NAPL observations were vertically bound by 1 foot of underlying sediment with no observation of NAPL within the same core.

Category 2/3 NAPL at EK006SC-D was observed in a thin sand layer at the bottom of the core. However, Category 2/3 NAPL observations were not present in the collocated core. Category 2/3 NAPL observations were bound laterally upstream by EK080SC-A and downstream by EK0079SC-A. The Category 2/3 NAPL observations were vertically bound by adjacent cores EK0079SC-A and EK036SC-A, which penetrated deeper than EK006SC-D, and did not contain NAPL.

Cross-section 2 extends from the Brooklyn shoreline to the Queens shoreline (north to south) across the creek (see Figure C4-16b). Category 2/3 NAPL observations were not observed in cross-section 2 cores. Three of the six cores on the cross-section were Phase 1 USEPA-identified cores. Collocated Phase 1 archive cores were processed to evaluate the

potential presence of NAPL using Phase 2 methods. A Phase 2 groundwater core was collected, collocated with EK009ASC and EK009CSC, both of which are USEPA-identified Phase 1 cores. At EK007ASC (the third Phase 1 USEPA-identified core on cross-section 1) and at EK008SC-B, Phase 1 archive cores were processed using Phase 2 methods. NAPL was not observed in any of the three cores processed using Phase 2 methods.

Cross-section 3 extends from the Brooklyn shoreline to the Queens shoreline (northwest to southeast) across the creek (see Figure C4-16c). Each of the ten cores on this cross-section (two Phase 1 shake-tested cores, and eight Phase 2 cores) contained at least one interval with Category 2/3 NAPL observations, ranging in thickness from 0.1 cm to 24 cm, which are generally present in coarser-grained lenses. Nine of the ten cores contained Category 2/3 NAPL observations in native material beneath 3.9 to 16.6 feet of overlying sediment. EK093SC-A is the one core where Category 2/3 NAPL observations were present in sediment, where the NAPL was observed in a thin sand layer located 3 feet below the mudline. The Brooklyn and Queens upland shorelines were the lateral limits of Category 2/3 NAPL observations. The vertical limits of Category 2/3 NAPL observations in the native material on the Queens side of the creek were defined by underlying sediment with no observations of NAPL. The vertical extent of Category 2/3 NAPL observations in the native material on the Brooklyn side of the creek are not delineated, extending to at least -30 feet NAVD88. However, given the depth of the Category 2/3 NAPL observations in native material on the Brooklyn side of the creek, coupled with the lack of NAPL observations in native material in upstream and downstream cores that penetrate to similar elevations, the vertical characterization of Category 2/3 NAPL in this area is complete for the purposes of RI evaluation.

Visual and shake test blebs were observed in sediment at the mudline at EK100SC-A. This is the only location in English Kills where NAPL was observed at the surface, and the lateral extent of NAPL in surface and shallow sediment is well delineated by surrounding cores (see Figure C4-16c) with no observations of NAPL in surface and near-surface sediment.

Cross-section 4 extends from the Brooklyn shoreline, downstream toward the confluence with East Branch, parallel to the shoreline (see Figure C4-16d). Category 2/3 NAPL

observations were 0.1 cm to 15 cm thick and generally present in coarser-grained lenses, located beneath 3.5 to 9.2 feet of overlying sediment.

At the upstream end of the cross-section, Category 2/3 NAPL observations were present at or near the sediment/native material interface (see Figure C4-16d). EK079SC-A is the upstream lateral limit of Category 2/3 NAPL observations (see Figure C4-16d). The vertical limit of Category 2/3 NAPL observations in cores located on the upstream end of the cross-section was defined by both underlying sediment with no observation of NAPL within the same core and by adjacent deeper cores (EK079SC-A, EK104SC-A, and EK094SC-A).

In downstream core EK003SC-B, Category 2/3 NAPL was observed approximately 9 feet below the mudline, at the bottom of the core in native material. Cores EK091SC-A and EK089SC-A are the downstream lateral limit of Category 2/3 NAPL observations (see Figure C4-16d). The vertical extent of Category 2/3 NAPL in the native material in downstream core EK003SC-B is not delineated, extending to at least -30 feet NAVD88. However, given the depth of the Category 2/3 NAPL observation in EK003SC-B, coupled with the lack of NAPL observations in native material in upstream and downstream cores that penetrate deeper than EK003SC-B, the characterization of Category 2/3 NAPL is complete for the purposes of the RI evaluation.

5 SUMMARY OF THE NAPL EVALUATION

This NAPL Evaluation has characterized the presence, nature, and extent of NAPL in Study Area sediment and native material to support preparation of the RI Report. The NAPL Evaluation incorporated data collected during RI investigation programs and data from investigations conducted by others in the Study Area. In general, visual observation of potential NAPL in sediment was consistent with shake test results (i.e., visual observations that indicated the potential for relatively more NAPL to be present in sediment were generally associated with more notable shake test results). It also considered other lines of evidence, such as the locations of potential point source discharges and industrial activities on upland sites adjacent to the Study Area.

Category 1A and Category 1B cores, which either contained no NAPL or residual NAPL, are located throughout the Study Area. Category 2/3 cores were found in localized areas in the main stem near CM 1.7, CM 2+ (i.e., the Turning Basin), and lower English Kills.

The Study Area was divided into 14 smaller areas with similar observations, using the NAPL observation categories. NAPL was not observed in Dutch Kills or Whale Creek where the most notable visual observations and shake test results were identified as sheen. There were also cores with no visual evidence of potential NAPL and negative shake tests. The majority of the Study Area (nine of the smaller areas) were classified as Category 1B Areas, where the most notable shake test observations were blebs (i.e., residual NAPL), although there were also numerous cores in Category 1B Areas where only negative shake tests were reported. The three remaining portions of the Study Area, with shake test layer results or coated and saturated visual observations, were identified as Category 2/3 Areas (see Figure C3-6).

Category 1B cores and Category 2/3 cores were further evaluated to characterize in detail the presence and extent of NAPL observed. The Category 1B evaluation covered more than half of the total Study Area and found that residual NAPL observations in Category 1B cores, and visual observations in Phase 1 USEPA-identified cores, do not represent more substantial areas of NAPL impacts, except for a portion of Area E, which was carried forward into the Category 2/3 evaluation. For the other 8 Category 1B Areas, NAPL delineation was completed in the Category 1B evaluation process.

The purpose of the Category 2/3 evaluation was to characterize the presence and extent (lateral and vertical limits) of NAPL in the Category 2/3 Areas. The lateral and vertical limits of Category 2/3 NAPL were delineated for each of the three Category 2/3 Areas, and in nearly all of the cores assessed. The exceptions are several individual cores in the Turning Basin and in the English Kills Category 2/3 Areas. In the Turning Basin, the vertical and lateral extent of NAPL at depth (greater than 50 feet below the mudline) in native material was not found in three cores located in close proximity to each other. In English Kills, the vertical extent of NAPL at depth in native material (greater than 10 feet below the mudline) was not defined in four cores located in close proximity to each other.

This dataset is sufficient for completing the RI because the NAPL was observed deep in the native material (greater than 10 to 50-plus feet below the mudline). In addition, there are data for the proximal overlying soft sediment and shallower native material that vertically and laterally delineate the extent of NAPL. The characterization of Category 2/3 NAPL is complete for the purposes of the RI evaluation. Additional evaluation of NAPL for the Feasibility Study will focus on the three Category 2/3 Areas.

The NAPL Evaluation has delineated the presence, nature, and extent of NAPL in accordance with the *Phase 2 Remedial Investigation Work Plan – Volume 2* (Anchor QEA 2014b) purposes and is complete for the purposes of the RI Report.

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TABLES

Table C2-1
Summary of Cores Included in the NAPL Evaluation by Sampling Program

Core Type	Program	Number of Stations	Number of Cores	Total Cores
Phase 1 Shake-Tested Cores	Phase 1 Investigation Cores	5	5	5
Phase 2 Shake-Tested Cores	Geochronology A/B	14	24	165
	Vertical Extent of Contamination	1	1	
	Confirmation of Contaminant Distribution in Unique Areas	16	20	
	Confirmation and Delineation of NAPL	4	4	
	Groundwater[1]	68	70[1]	
	High Resolution	12	15	
	NYC Post-Dredge Areas Sampling	10	12	
	Phase 1 Archive Cores Processed during Phase 2 Investigation	19	19	
Total Number of Shake-Tested Cores		**149**	**170**	**170**
Not Shake-Tested[2]	Phase 1 USEPA-Identified Cores	18	20[3]	N/A
	National Grid Cores	42	42	N/A

Notes:
1 = Includes four groundwater program cores with no visual evidence and where shake tests were not conducted; referred to as Phase 2 deviation cores.
2 = Shake-tests were not conducted for Phase 1 USEPA-identified cores and National Grid cores. Phase 1 USEPA-identified cores include visual observations logged using Phase 1 terms. National Grid cores include visual observations logged
3 = Two of the 20 Phase 1 USEPA-identified cores are Phase 1 shake-tested cores.

Acronyms:
N/A = not applicable, shake test not conducted
NAPL = nonaqueous phase liquid
NYC = New York City
USEPA = U.S. Environmental Protection Agency

Table C3-1
Core Collection Details for Cores Processed Using Phase 1 Methods

Core ID	Core Type	Core Process Date	Core Sample Method	Core Penetration Depth (cm below mudline)	Field Recovery Length (cm)	Depth to Native Material (cm below mudline)	Shake Test Count	Distance from Newtown Creek Mouth (miles)	Core Surface Elevation (feet NAVD88)
EK004ASC	Phase 1 Shake Tested	6/27/2012	Vibracore	579	564	294	1	3.04	-3.5
EK005BSC	Phase 1 Shake Tested	7/9/2012	Vibracore	527	491	273	1	3.04	-11.0
EK007ASC	Phase 1 USEPA-Identified	6/27/2012	Vibracore	579	543	436	N/A	3.23	-14.0
EK009ASC	Phase 1 USEPA-Identified	6/26/2012	Vibracore	579	552	286	N/A	3.23	-14.6
EK009CSC	Phase 1 USEPA-Identified	6/26/2012	Vibracore	579	506	307	N/A	3.23	-14.1
EK018ASC	Phase 1 USEPA-Identified	6/28/2012	Vibracore	579	472	377	N/A	3.68	-3.2
NC016BSC	Phase 1 USEPA-Identified	5/31/2012	Vibracore	411	393	319	N/A	0.50	-13.9
NC022CSC	Phase 1 USEPA-Identified	5/19/2012	Vibracore	280	213	182	N/A	0.70	-22.3
NC023ASC	Phase 1 USEPA-Identified	5/16/2012	Vibracore	305	283	230	N/A	0.70	-15.4
NC030BSC	Phase 1 USEPA-Identified	5/30/2012	Vibracore	256	253	205	N/A	1.07	-22.8
NC032ASC	Phase 1 USEPA-Identified	5/22/2012	Vibracore	472	415	357	N/A	1.08	-13.7
NC036BSC	Phase 1 USEPA-Identified	5/23/2012	Vibracore	347	323	193	N/A	1.26	-17.6
NC036CSC	Phase 1 USEPA-Identified	5/23/2012	Vibracore	393	357	145	N/A	1.26	-17.9
NC037ASC	Phase 1 USEPA-Identified	5/21/2012	Vibracore	259	238	153	N/A	1.25	-23.3
NC044ASC	Phase 1 USEPA-Identified	6/1/2012	Vibracore	579	506	186	N/A	1.45	-12.0
NC045BSC	Phase 1 USEPA-Identified	7/11/2012	Vibracore	244	253	119	N/A	1.54	-23.1
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	6/4/2012	Vibracore	506	515	266	1	1.64	-16.4
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	6/4/2012	Vibracore	326	308	246	1	1.63	-11.7
NC051ASC	Phase 1 USEPA-Identified	7/4/2012	Vibracore	405	405	310	N/A	1.72	-14.0
NC055ASC	Phase 1 USEPA-Identified	7/10/2012	Vibracore	378	427	189	N/A	1.82	-21.9
NC069ASC	Phase 1 USEPA-Identified	6/14/2012	Vibracore	579	491	319	N/A	2.43	-19.3
NC071CSC	Phase 1 Shake Tested	7/3/2012	Vibracore	579	515	NE	1	2.44	-16.1
NC073BSC	Phase 1 USEPA-Identified	6/13/2012	Vibracore	585	585	364	N/A	2.56	-21.6

Notes:
Shake test count = total number of shake tests performed per sediment core.
Core surface elevation = elevation of mudline surface in feet NAVD88.

Acronyms:
cm = centimeter
N/A = not applicable, shake test not conducted
NAVD88 = North American Vertical Datum of 1988
NE = native material not encountered
USEPA = U.S. Environmental Protection Agency

Table C3-2
Core Collection Details for Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Core Sample Method	Core Penetration Depth (cm below mudline)	Field Recovery Length (cm)	Depth to Native Material (cm below mudline)	Shake Test Count	Distance from Newtown Creek Mouth (miles)	Core Surface Elevation (feet NAVD88)
DK012SC-A	Phase 2 Groundwater	8/1/2014	Direct Push	914	579	610	2	0.95	-4.5
DK041SC-A	Phase 2 Groundwater	7/31/2014	Direct Push	914	457	544	1	0.94	-14.5
DK042SC-A	Phase 2 Groundwater	10/9/2014	Direct Push and Piston Core	732	518	366	1	1.15	-8.7
DK043SC-A	Phase 2 Groundwater	10/9/2014	Direct Push and Piston Core	1,006	637	719	2	1.26	-7.8
DK044SC-A	Phase 2 Groundwater	10/17/2014	Direct Push and Piston Core	762	600	343	1	1.32	-8.2
DK045SC-A	Phase 2 Groundwater	10/16/2014	Direct Push and Piston Core	716	259	533	1	1.38	-12.9
DK052SC-A	Phase 2 Groundwater	10/15/2014	Direct Push and Piston Core	640	250	244	0	1.45	-10.9
EB025SC-A	Phase 2 Groundwater	10/29/2014	Direct Push and Piston Core	762	457	518	2	3.18	-5.8
EB046SC-A	Phase 2 Groundwater	11/10/2014	Direct Push and Piston Core	777	445	481	1	2.91	-14.1
EB047SC-A	Phase 2 Groundwater	11/6/2014	Direct Push and Piston Core	457	180	152	1	2.92	-13.7
EB048SC-A	Phase 2 Groundwater	10/31/2014	Direct Push and Piston Core	366	232	91	2	2.98	-13.2
EB049SC-A	Phase 2 Groundwater	10/28/2014	Direct Push and Piston Core	427	165	122	0	2.98	-11.1
EB050SC-A	Phase 2 Groundwater	10/27/2014	Direct Push and Piston Core	701	503	457	1	2.98	-3.8
EB051SC-A	Phase 2 Groundwater	11/1/2014	Direct Push and Piston Core	610	354	305	1	3.07	-12.9
EB052SC-A	Phase 2 Groundwater	10/30/2014	Direct Push and Piston Core	945	402	579	1	3.12	-8.0
EK009SC-A	Phase 2 Groundwater	9/19/2014	Direct Push and Piston Core	671	354	366	1	3.23	-14.7
EK013SC-A	Phase 2 Groundwater	9/18/2014	Direct Push and Piston Core	975	546	423	0	3.43	-9.4
EK026SC-A	Phase 2 Groundwater	11/13/2014	Direct Push and Piston Core	792	475	390	1	3.73	-4.1
EK036SC-A	Phase 2 Groundwater	9/23/2014	Direct Push and Piston Core	762	463	309	2	3.10	-16.6
EK042SC-A	Phase 2 Groundwater	11/11/2014	Direct Push and Piston Core	823	465	518	3	3.31	-3.5
EK070SC-A	Phase 2 Groundwater	9/17/2014	Direct Push and Piston Core	503	250	206	1	3.60	-11.4
EK090SC-A	Phase 2 Groundwater	8/22/2014	Direct Push and Piston Core	549	494	275	3	2.85	-17.2
EK091SC-A	Phase 2 Groundwater	10/1/2014	Direct Push and Piston Core	604	378	250	2	2.91	-20.1
EK092SC-A	Phase 2 Groundwater	9/25/2014	Direct Push and Piston Core	396	201	88	2	2.95	-16.7
EK093SC-A	Phase 2 Groundwater	11/7/2014	Direct Push and Piston Core	290	174	120	2	3.04	-16.1
EK094SC-A	Phase 2 Groundwater	9/22/2014	Direct Push and Piston Core	701	616	215	1	3.05	-18.6
EK096SC-A	Phase 2 Groundwater	9/18/2014	Direct Push and Piston Core	671	360	380	1	3.49	-9.0
EK097SC-A	Phase 2 Groundwater	9/16/2014	Direct Push and Piston Core	518	207	226	1	3.59	-9.0
EK098SC-D	Phase 2 Groundwater	9/15/2014	Direct Push and Piston Core	640	375	122	0	3.59	-9.3
EK099SC-A	Phase 2 Groundwater	11/14/2014	Direct Push and Piston Core	640	351	396	1	3.69	-4.8
MC029SC-A	Phase 2 Groundwater	8/26/2014	Direct Push and Piston Core	1,052	732	411	3	2.50	-2.8
MC030SC-A	Phase 2 Groundwater	8/28/2014	Direct Push and Piston Core	1,082	802	745	4	2.53	-3.2
MC031SC-A	Phase 2 Groundwater	8/27/2014	Direct Push and Piston Core	1,006	646	734	3	2.60	-3.0
NC029SC-A	Phase 2 Groundwater	9/10/2014	Direct Push and Piston Core	610	408	366	5	1.01	-16.0
NC056SC-A	Phase 2 Groundwater	9/4/2014	Direct Push and Piston Core	457	408	263	4	1.83	-14.9
NC062SC-A	Phase 2 Groundwater	11/20/2014	Direct Push	762	405	533	2	2.07	-20.0
NC069SC-A	Phase 2 Groundwater	9/2/2014	Direct Push and Piston Core	914	399	457	5	2.43	-17.8
NC075SC-A	Phase 2 Groundwater	8/20/2014	Direct Push and Piston Core	701	456	396	4	2.61	-18.1
NC218SC-A	Phase 2 Groundwater	11/18/2014	Direct Push	640	296	222	2	2.58	-11.5
NC266SC-A	Phase 2 Groundwater	11/8/2014	Direct Push and Piston Core	610	384	365	3	0.08	-14.7
NC267SC-A	Phase 2 Groundwater	9/12/2014	Direct Push and Piston Core	914	552	671	4	0.23	-9.9
NC268SC-A	Phase 2 Groundwater	9/29/2014	Direct Push and Piston Core	884	463	530	3	0.23	-10.0
NC269SC-A	Phase 2 Groundwater	9/5/2014	Direct Push and Piston Core	549	287	305	2	0.49	-21.1
NC270SC-D	Phase 2 Groundwater	9/11/2014	Direct Push and Piston Core	427	311	101	2	0.70	-16.3
NC271SC-A	Phase 2 Groundwater	12/3/2014	Direct Push and Piston Core	488	448	188	2	0.68	-16.4
NC271SC-B	Phase 2 Groundwater	1/7/2015	Piston Core	155	155	NE	3	0.68	-15.9
NC271SC-C	Phase 2 Groundwater	1/7/2015	Piston Core	168	168	NE	4	0.68	-14.2
NC272SC-A	Phase 2 Groundwater	12/4/2014	Direct Push and Piston Core	427	329	152	1	0.79	-19.8
NC273SC-A	Phase 2 Groundwater	8/4/2014	Direct Push	732	229	327	2	1.08	-20.3
NC275SC-A	Phase 2 Groundwater	9/27/2014	Direct Push and Piston Core	457	210	174	2	1.11	-18.9
NC276SC-A	Phase 2 Groundwater	12/5/2014	Direct Push and Piston Core	472	454	233	3	1.26	-19.9
NC277SC-A	Phase 2 Groundwater	12/2/2014	Direct Push and Piston Core	549	445	283	2	1.29	-19.0
NC278SC-A	Phase 2 Groundwater	12/1/2014	Direct Push and Piston Core	427	372	128	3	1.41	-22.5
NC279SC-A	Phase 2 Groundwater	8/5/2014	Direct Push	823	427	354	2	1.51	-14.3
NC280SC-A	Phase 2 Groundwater	8/8/2014	Direct Push	381	165	162	1	1.50	-20.0
NC281SC-A	Phase 2 Groundwater	8/7/2014	Direct Push	625	168	324	2	1.65	-11.8
NC282SC-A	Phase 2 Groundwater	10/2/2014	Direct Push	610	262	375	2	1.70	-14.9
NC284SC-A	Phase 2 Groundwater	8/12/2014	Direct Push and Piston Core	853	610	579	3	2.02	-11.1
NC286SC-A	Phase 2 Groundwater	11/17/2014	Direct Push and Piston Core	914	610	354	2	2.23	-18.5
NC287SC-A	Phase 2 Groundwater	8/13/2014	Direct Push and Piston Core	1,158	884	579	3	2.40	-12.9
NC288SC-A	Phase 2 Groundwater	11/15/2014	Direct Push and Piston Core	762	622	412	2	2.42	-21.2
NC296SC-A	Phase 2 Groundwater	8/19/2014	Direct Push and Piston Core	671	479	426	5	2.50	-20.0
NC298SC-A	Phase 2 Groundwater	8/21/2014	Direct Push and Piston Core	823	506	579	4	2.65	-16.8
NC299SC-A	Phase 2 Groundwater	8/18/2014	Direct Push	488	189	160	2	2.78	-19.8
NC300SC-A	Phase 2 Groundwater	8/15/2014	Direct Push and Piston Core	579	360	232	2	2.81	-17.9
NC319SC-A	Phase 2 Groundwater	8/14/2014	Direct Push and Piston Core	1,128	640	762	4	2.49	-6.6
NC320SC-A	Phase 2 Groundwater	11/24/2014	Direct Push and Piston Core	884	515	732	3	0.52	-9.7

Table C3-2
Core Collection Details for Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Core Sample Method	Core Penetration Depth (cm below mudline)	Field Recovery Length (cm)	Depth to Native Material (cm below mudline)	Shake Test Count	Distance from Newtown Creek Mouth (miles)	Core Surface Elevation (feet NAVD88)
WC008SC-A	Phase 2 Groundwater	11/3/2014	Direct Push and Piston Core	533	381	229	3	1.10	-8.3
WC017SC-A	Phase 2 Groundwater	9/9/2014	Direct Push and Piston Core	610	515	361	5	1.04	-13.5
WC018SC-A	Phase 2 Groundwater	9/8/2014	Direct Push and Piston Core	762	436	457	4	1.05	-13.4
DK033SC-A	Phase 2 Subsurface	7/7/2014	Vibracore	427	320	NE	3	1.45	-2.9
DK033SC-D	Phase 2 Subsurface	6/18/2014	Vibracore	421	320	NE	N/A	1.45	-3.2
DK033SC-G	Phase 2 Subsurface	6/18/2014	Vibracore	393	323	NE	4	1.45	-3.2
DK037SC-A	Phase 2 Subsurface	6/17/2014	Piston Core	116	113	NE	1	1.25	-2.1
DK037SC-B	Phase 2 Subsurface	6/17/2014	Piston Core	122	116	NE	N/A	1.25	-2.3
DK037SC-E	Phase 2 Subsurface	6/17/2014	Piston Core	122	110	NE	N/A	1.25	-2.3
EB006SC-A	Phase 2 Subsurface	7/18/2014	Vibracore	122	122	NE	2	2.94	-17.3
EB040SC-A	Phase 2 Subsurface	7/17/2014	Vibracore	594	506	NE	4	3.17	-4.9
EB040SC-D	Phase 2 Subsurface	7/21/2014	Vibracore	488	408	NE	5	3.17	-4.3
EB040SC-E	Phase 2 Subsurface	7/22/2014	Vibracore	305	250	NE	3	3.17	-4.7
EB041SC-A	Phase 2 Subsurface	6/12/2014	Vibracore	457	475	344	3	2.85	-14.7
EB041SC-B	Phase 2 Subsurface	6/12/2014	Vibracore	457	445	360	1	2.85	-15.3
EB045SC-A	Phase 2 Subsurface	7/24/2014	Vibracore	594	524	496	5	2.93	-9.1
EB045SC-B	Phase 2 Subsurface	7/23/2014	Vibracore	533	512	466	7	2.92	-8.8
EK006SC-C	Phase 2 Subsurface	7/3/2014	Vibracore	113	110	NE	2	3.07	-21.6
EK006SC-D	Phase 2 Subsurface	7/3/2014	Vibracore	116	107	NE	2	3.07	-21.7
EK078SC-C	Phase 2 Subsurface	6/23/2014	Vibracore	183	223	90	1	2.82	-23.4
EK079SC-A	Phase 2 Subsurface	6/23/2014	Vibracore	579	607	386	2	3.07	-13.4
EK080SC-A	Phase 2 Subsurface	6/10/2014	Vibracore	488	457	272	2	3.15	-15.4
EK081SC-A	Phase 2 Subsurface	6/13/2014	Vibracore	549	539	500	2	3.16	-11.3
EK081SC-B	Phase 2 Subsurface	6/13/2014	Vibracore	457	405	NE	N/A	3.16	-10.9
EK082SC-A	Phase 2 Subsurface	6/11/2014	Vibracore	533	518	239	2	3.29	-16.1
EK082SC-B	Phase 2 Subsurface	6/11/2014	Vibracore	351	320	290	N/A	3.29	-16.3
EK083SC-B	Phase 2 Subsurface	6/12/2014	Vibracore	610	536	NE	N/A	3.31	-2.7
EK083SC-C	Phase 2 Subsurface	6/12/2014	Vibracore	610	552	NE	3	3.31	-5.1
EK084SC-C	Phase 2 Subsurface	6/20/2014	Vibracore	579	552	426	1	3.51	-4.9
EK085SC-D	Phase 2 Subsurface	7/10/2014	Vibracore	411	378	120	5	3.49	-10.6
EK089SC-A	Phase 2 Subsurface	7/29/2014	Vibracore	561	561	212	6	2.90	-17.9
EK100SC-A	Phase 2 Subsurface	7/10/2014	Vibracore	463	524	100	12	3.03	-13.2
EK101SC-A	Phase 2 Subsurface	7/10/2014	Vibracore	305	335	103	5	3.04	-13.8
EK102SC-C	Phase 2 Subsurface	7/1/2014	Vibracore	564	576	330	5	3.76	-3.3
EK102SC-D	Phase 2 Subsurface	7/3/2014	Vibracore	488	475	284	2	3.76	-3.2
EK103SC-A	Phase 2 Subsurface	7/8/2014	Vibracore	229	216	116	8	3.03	-20.0
EK104SC-A	Phase 2 Subsurface	7/14/2014	Vibracore	305	274	133	9	3.05	-19.9
MC005SC-E	Phase 2 Subsurface	6/19/2014	Piston Core	122	119	NE	1	2.51	-2.7
MC007SC-A	Phase 2 Subsurface	7/9/2014	Vibracore	488	383	NE	5	2.62	-1.9
MC007SC-C	Phase 2 Subsurface	7/9/2014	Vibracore	475	404	NE	4	2.63	-2.3
NC003SC-F	Phase 2 Subsurface	7/22/2014	Vibracore	122	116	NE	2	0.09	-20.4
NC012SC-C	Phase 2 Subsurface	7/21/2014	Vibracore	122	122	NE	3	0.44	-19.1
NC012SC-F	Phase 2 Subsurface	7/21/2014	Vibracore	152	146	NE	3	0.44	-20.6
NC037SC-D	Phase 2 Subsurface	6/30/2014	Vibracore	122	113	NE	2	1.25	-24.0
NC071SC-B	Phase 2 Subsurface	7/2/2014	Piston Core	122	122	NE	3	2.44	-15.2
NC154SC-D	Phase 2 Subsurface	6/26/2014	Piston Core	125	122	NE	2	0.16	-5.7
NC161SC-A	Phase 2 Subsurface	6/27/2014	Vibracore	122	107	NE	1	0.62	-21.7
NC161SC-B	Phase 2 Subsurface	6/27/2014	Vibracore	122	134	NE	2	0.62	-21.4
NC161SC-C	Phase 2 Subsurface	6/27/2014	Vibracore	122	119	NE	1	0.62	-21.7
NC169SC-C	Phase 2 Subsurface	6/19/2014	Vibracore	122	122	NE	1	1.98	-21.3
NC169SC-D	Phase 2 Subsurface	6/19/2014	Vibracore	107	107	NE	N/A	1.98	-21.5
NC174SC-D	Phase 2 Subsurface	7/2/2014	Vibracore	122	116	NE	3	2.35	-23.9
NC176SC-A	Phase 2 Subsurface	7/30/2014	Vibracore	579	524	370	7	2.47	-5.2
NC176SC-B	Phase 2 Subsurface	7/30/2014	Vibracore	579	521	377	N/A	2.47	-5.2
NC229SC-A	Phase 2 Subsurface	6/25/2014	Vibracore	320	378	110	3	2.30	-16.9
NC229SC-B	Phase 2 Subsurface	6/25/2014	Vibracore	366	375	130	1	2.30	-16.0
NC230SC-A	Phase 2 Subsurface	6/25/2014	Vibracore	427	448	160	1	2.32	-14.3
NC230SC-B	Phase 2 Subsurface	6/25/2014	Vibracore	305	296	200	2	2.32	-14.4
NC233SC-A	Phase 2 Subsurface	6/16/2014	Vibracore	442	454	163	2	2.57	-5.2
NC233SC-B	Phase 2 Subsurface	6/13/2014	Vibracore	357	384	178	N/A	2.58	-5.5
NC251SC-A	Phase 2 Subsurface	7/11/2014	Vibracore	579	509	470	3	0.16	-6.9
NC253SC-A	Phase 2 Subsurface	7/23/2014	Vibracore	122	125	NE	2	0.21	-20.0
NC254SC-G	Phase 2 Subsurface	7/28/2014	Vibracore	122	116	NE	2	0.31	-18.7
NC255SC-A	Phase 2 Subsurface	7/28/2014	Vibracore	122	110	NE	3	0.38	-19.2
NC256SC-A	Phase 2 Subsurface	7/25/2014	Vibracore	122	104	NE	1	0.50	-21.1
NC256SC-B	Phase 2 Subsurface	7/25/2014	Vibracore	122	119	NE	2	0.50	-22.3
NC256SC-G	Phase 2 Subsurface	7/25/2014	Vibracore	122	113	NE	N/A	0.50	-20.9
NC257SC-F	Phase 2 Subsurface	7/28/2014	Vibracore	122	120	NE	2	0.53	-8.1

Table C3-2
Core Collection Details for Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Core Sample Method	Core Penetration Depth (cm below mudline)	Field Recovery Length (cm)	Depth to Native Material (cm below mudline)	Shake Test Count	Distance from Newtown Creek Mouth (miles)	Core Surface Elevation (feet NAVD88)
NC258SC-A	Phase 2 Subsurface	7/24/2014	Vibracore	271	238	188	5	0.72	-14.0
NC258SC-D	Phase 2 Subsurface	7/8/2014	Vibracore	314	271	255	2	0.72	-14.0
NC258SC-E	Phase 2 Subsurface	7/16/2014	Vibracore	235	229	206	3	0.72	-15.4
NC258SC-F	Phase 2 Subsurface	7/14/2014	Vibracore	253	241	NE	4	0.72	-15.9
NC259SC-A	Phase 2 Subsurface	6/30/2014	Vibracore	122	119	NE	2	0.81	-23.4
NC260SC-E	Phase 2 Subsurface	7/25/2014	Vibracore	91	76	NE	3	0.85	-19.3
NC261SC-A	Phase 2 Subsurface	7/31/2014	Vibracore	396	381	171	4	1.22	-16.0
NC262SC-A	Phase 2 Subsurface	7/29/2014	Vibracore	372	357	200	5	1.66	-10.4
NC263SC-C	Phase 2 Subsurface	7/30/2014	Vibracore	579	579	210	4	2.03	-7.4
NC264SC-B	Phase 2 Subsurface	7/31/2014	Vibracore	518	500	436	6	2.24	-20.7
NC265SC-A	Phase 2 Subsurface	7/16/2014	Vibracore	594	579	352	8	2.64	-16.9
NC265SC-B	Phase 2 Subsurface	7/17/2014	Vibracore	439	387	278	4	2.64	-18.2
NC295SC-A	Phase 2 Subsurface	9/30/2014	Direct Push and Piston Core	939	372	814	3	0.04	-11.0
NC306SC-C	Phase 2 Subsurface	6/24/2014	Vibracore	198	195	NE	2	2.29	-21.3
NC307SC-B	Phase 2 Subsurface	6/24/2014	Vibracore	610	591	513	2	2.40	-15.0
NC308SC-A	Phase 2 Subsurface	6/16/2014	Vibracore	610	600	NE	2	2.47	-6.5
NC308SC-B	Phase 2 Subsurface	6/16/2014	Vibracore	610	570	NE	1	2.47	-6.9
NC309SC-A	Phase 2 Subsurface	6/13/2014	Vibracore	579	594	NE	N/A	2.67	-11.0
NC309SC-B	Phase 2 Subsurface	6/13/2014	Vibracore	610	610	NE	N/A	2.67	-11.9
NC309SC-C	Phase 2 Subsurface	6/13/2014	Vibracore	610	622	NE	5	2.67	-14.1
WC003SC-F	Phase 2 Subsurface	7/22/2014	Vibracore	91	91	NE	2	1.04	-17.5
WC003SC-G	Phase 2 Subsurface	7/22/2014	Vibracore	91	91	NE	N/A	1.04	-18.2
WC003SC-H	Phase 2 Subsurface	7/22/2014	Vibracore	91	91	NE	N/A	1.04	-18.9
WC012SC-B	Phase 2 Subsurface	6/26/2014	Piston Core	128	128	NE	2	1.07	-9.9
WC015SC-E	Phase 2 Subsurface	7/25/2014	Vibracore	122	119	NE	3	1.00	-20.5
WC015SC-F	Phase 2 Subsurface	7/25/2014	Vibracore	122	104	NE	N/A	1.00	-20.4
WC015SC-G	Phase 2 Subsurface	7/25/2014	Vibracore	122	110	NE	N/A	1.00	-20.5
EK003SC-B	Processed Phase 1 Archive	7/1/2014	Vibracore	326	296	123	6	2.95	-21.0
EK004SC-B	Processed Phase 1 Archive	6/30/2014	Vibracore	579	546	270	9	3.04	-3.2
EK005SC-A	Processed Phase 1 Archive	7/4/2014	Vibracore	518	436	90	7	3.04	-10.6
EK007SC-B	Processed Phase 1 Archive	11/19/2015	Vibracore	579	512	380	7	3.23	-14.4
EK008SC-B	Processed Phase 1 Archive	11/19/2015	Vibracore	381	390	228	5	3.23	-21.6
NC022SC-B	Processed Phase 1 Archive	1/7/2015	Vibracore	320	250	174	4	0.69	-22.2
NC023SC-B	Processed Phase 1 Archive	1/8/2015	Vibracore	335	274	241	4	0.70	-14.9
NC036SC-A	Processed Phase 1 Archive	8/26/2015	Vibracore	439	497	131	8	1.26	-17.6
NC044SC-B	Processed Phase 1 Archive	8/27/2015	Vibracore	579	433	217	7	1.45	-13.2
NC045SC-A	Processed Phase 1 Archive	8/25/2015	Vibracore	268	283	111	6	1.54	-21.6
NC048SC-E	Processed Phase 1 Archive	8/25/2015	Vibracore	433	369	281	8	1.64	-17.6
NC049SC-A	Processed Phase 1 Archive	8/25/2015	Vibracore	195	155	NE	3	1.63	-21.0
NC050SC-B	Processed Phase 1 Archive	8/24/2015	Vibracore	335	287	178	3	1.63	-12.2
NC051SC-B	Processed Phase 1 Archive	8/25/2015	Vibracore	381	360	260	5	1.73	-13.3
NC055SC-B	Processed Phase 1 Archive	8/27/2015	Vibracore	332	372	160	5	1.82	-21.9
NC069SC-B	Processed Phase 1 Archive	8/26/2015	Vibracore	610	622	300	9	2.43	-19.9
NC072SC-B	Processed Phase 1 Archive	11/19/2015	Vibracore	582	469	296	9	2.56	-19.3
NC073SC-A	Processed Phase 1 Archive	11/18/2015	Vibracore	564	573	292	9	2.56	-21.4
NC074SC-B	Processed Phase 1 Archive	11/18/2015	Vibracore	579	524	290	10	2.56	-8.0

Notes:
Shake test count = total number of shake tests performed per sediment core.
Cores with shake test count of 0 are Phase 2 deviation cores.
Core surface elevation = elevation of mudline surface in feet NAVD88.

Acronyms:
cm = centimeter
N/A = not applicable, shake test not conducted
NAVD88 = North American Vertical Datum of 1988
NE = native material not encountered

Table C3-3
Core Collection Details for National Grid Cores

Core ID	Core Process Date	Core Sample Method	Core Penetration Depth (cm below mudline)	Field Recovery Length (cm)	Depth to Native Material (cm below mudline)	Distance from Newtown Creek Mouth (miles)	Core Surface Elevation (feet NAVD88)
GPEC-GT12	9/1/2009	Split-spoon	2,012	N/A	716	2.66	-14.9
GPEC-GT14	9/1/2009	Split-spoon	1,585	N/A	731	2.61	-16.1
GPEC-GT16	8/25/2009	Split-spoon	3,109	N/A	716	2.55	-16.0
GPEC-GT18	9/3/2009	Split-spoon	1,737	N/A	518	2.48	-15.1
GPEC-GT20	9/9/2009	Split-spoon	2,036	N/A	530	2.41	-19.4
GPEC-GT22	9/15/2009	Split-spoon	1,585	N/A	350	2.33	-16.5
GPEC-SB110	6/28/2010	Rotosonic and Split-spoon	2,286	N/A	457	2.65	-16.0
GPEC-SB111	7/2/2010	Rotosonic and Split-spoon	2,469	N/A	579	2.62	-21.9
GPEC-SB112	7/6/2010	Rotosonic and Split-spoon	2,926	N/A	640	2.61	-24.9
GPEC-SB113	7/19/2010	Rotosonic and Split-spoon	3,170	N/A	426	2.43	-26.6
GPEC-SB114	7/22/2010	Rotosonic and Split-spoon	2,591	N/A	490	2.38	-24.0
GPEC-SED01	6/23/2010	Vibracore	610	381	259	2.67	-14.4
GPEC-SED02	6/23/2010	Vibracore	610	491	358	2.67	-13.8
GPEC-SED03	6/21/2010	Vibracore	610	320	299	2.67	-11.7
GPEC-SED04	6/23/2010	Vibracore	610	463	251	2.65	-17.8
GPEC-SED05	6/23/2010	Vibracore	610	402	237	2.65	-15.9
GPEC-SED06	6/21/2010	Vibracore	610	454	365	2.65	-18.3
GPEC-SED07	6/23/2010	Vibracore	610	427	277	2.63	-18.5
GPEC-SED08	6/23/2010	Vibracore	610	393	281	2.62	-18.3
GPEC-SED09	6/21/2010	Vibracore	610	436	350	2.62	-18.2
GPEC-SED10	6/24/2010	Vibracore	610	375	307	2.60	-22.4
GPEC-SED11	6/24/2010	Vibracore	610	290	228	2.60	-17.8
GPEC-SED12	6/22/2010	Vibracore	610	358	263	2.60	-16.9
GPEC-SED13	6/22/2010	Vibracore	610	363	182	2.58	-22.0
GPEC-SED14	6/22/2010	Vibracore	610	387	251	2.58	-19.8
GPEC-SED15	6/22/2010	Vibracore	610	292	140	2.57	-18.4
GPEC-SED16	6/22/2010	Vibracore	610	393	199	2.55	-22.0
GPEC-SED17	6/22/2010	Vibracore	610	424	329	2.56	-22.1
GPEC-SED18	6/22/2010	Vibracore	610	472	327	2.55	-16.8
GPEC-SED19	6/24/2010	Vibracore	610	393	289	2.45	-23.0
GPEC-SED20	6/24/2010	Vibracore	610	366	253	2.45	-19.7
GPEC-SED21	6/25/2010	Vibracore	610	293	137	2.32	-18.6
GPEC-SED22	6/24/2010	Vibracore	610	402	222	2.32	-13.8
GPEC-SED23	6/25/2010	Vibracore	610	366	97	2.37	-25.8
GPEC-SED24	6/25/2010	Vibracore	610	320	213	2.50	-17.0
GPEC-SED25	6/25/2010	Vibracore	610	315	253	2.57	-19.9
GPEC-SED26	6/25/2010	Vibracore	610	376	304	2.63	-15.3
GPEC-SED27	6/25/2010	Vibracore	610	390	228	2.57	-18.1
GPEC-SED28	6/25/2010	Vibracore	610	450	NE	2.44	-11.7
GPEC-SED29	6/25/2010	Vibracore	610	475	381	2.52	-19.9
GPEC-SED30	6/25/2010	Vibracore	610	399	236	2.50	-21.5
GPEC-SED31	6/25/2010	Vibracore	610	506	114	2.38	-26.9

Note:
Core surface elevation = elevation of mudline surface in feet NAVD88.

Acronyms:
cm = centimeter
N/A = not applicable (refer to Greenpoint Energy Center field core logs)
NAVD88 = North American Vertical Datum of 1988
NE = native material not encountered

Table C3-4
Detailed Visual and Shake Test Observations by Depth for Cores Processed Using Phase 1 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
EK004ASC	Phase 1 Shake Tested	0	14	N/A	None	N/A	N/A
EK004ASC	Phase 1 Shake Tested	14	40	N/A	Oil-coated	N/A	N/A
EK004ASC	Phase 1 Shake Tested	40	142	N/A	None	N/A	N/A
EK004ASC	Phase 1 Shake Tested	142	294	N/A	None	N/A	N/A
EK004ASC	Phase 1 Shake Tested	294	410	N/A	None	N/A	N/A
EK004ASC	Phase 1 Shake Tested	410	511	N/A	None	N/A	N/A
EK004ASC	Phase 1 Shake Tested	511	557	550	Oil-wetted	Layer	NB
EK005BSC	Phase 1 Shake Tested	0	32	N/A	None	N/A	N/A
EK005BSC	Phase 1 Shake Tested	32	214	N/A	Oil-stained	N/A	N/A
EK005BSC	Phase 1 Shake Tested	214	273	214	Oil-wetted	Layer	NB
EK005BSC	Phase 1 Shake Tested	273	360	N/A	Oil-wetted	N/A	N/A
EK005BSC	Phase 1 Shake Tested	360	484	N/A	None	N/A	N/A
EK007ASC	Phase 1 USEPA-Identified	0	29	N/A	None	N/A	N/A
EK007ASC	Phase 1 USEPA-Identified	29	52	N/A	None	N/A	N/A
EK007ASC	Phase 1 USEPA-Identified	52	108	N/A	Oil-stained	N/A	N/A
EK007ASC	Phase 1 USEPA-Identified	108	436	N/A	Oil-stained	N/A	N/A
EK007ASC	Phase 1 USEPA-Identified	436	541	N/A	None	N/A	N/A
EK009ASC	Phase 1 USEPA-Identified	0	18	N/A	None	N/A	N/A
EK009ASC	Phase 1 USEPA-Identified	18	85	N/A	None	N/A	N/A
EK009ASC	Phase 1 USEPA-Identified	85	286	N/A	Oil-stained	N/A	N/A
EK009ASC	Phase 1 USEPA-Identified	286	532	N/A	None	N/A	N/A
EK009CSC	Phase 1 USEPA-Identified	0	40	N/A	None	N/A	N/A
EK009CSC	Phase 1 USEPA-Identified	40	57	N/A	None	N/A	N/A
EK009CSC	Phase 1 USEPA-Identified	57	307	N/A	Oil-stained	N/A	N/A
EK009CSC	Phase 1 USEPA-Identified	307	486	N/A	None	N/A	N/A
EK018ASC	Phase 1 USEPA-Identified	0	14	N/A	None	N/A	N/A
EK018ASC	Phase 1 USEPA-Identified	14	94	N/A	None	N/A	N/A
EK018ASC	Phase 1 USEPA-Identified	94	377	N/A	Oil-stained	N/A	N/A
EK018ASC	Phase 1 USEPA-Identified	377	458	N/A	None	N/A	N/A
NC016BSC	Phase 1 USEPA-Identified	0	44	N/A	None	N/A	N/A
NC016BSC	Phase 1 USEPA-Identified	44	124	N/A	None	N/A	N/A
NC016BSC	Phase 1 USEPA-Identified	124	288	N/A	Oil-stained	N/A	N/A
NC016BSC	Phase 1 USEPA-Identified	288	305	N/A	Oil-coated	N/A	N/A
NC016BSC	Phase 1 USEPA-Identified	305	314	N/A	Oil-stained	N/A	N/A
NC016BSC	Phase 1 USEPA-Identified	314	373	N/A	None	N/A	N/A
NC022CSC	Phase 1 USEPA-Identified	0	70	N/A	None	N/A	N/A
NC022CSC	Phase 1 USEPA-Identified	70	105	N/A	None	N/A	N/A
NC022CSC	Phase 1 USEPA-Identified	105	180	N/A	Oil-wetted	N/A	N/A
NC022CSC	Phase 1 USEPA-Identified	180	200	N/A	Oil-wetted	N/A	N/A
NC023ASC	Phase 1 USEPA-Identified	0	40	N/A	None	N/A	N/A
NC023ASC	Phase 1 USEPA-Identified	40	40	N/A	Sheen	N/A	N/A
NC023ASC	Phase 1 USEPA-Identified	40	74	N/A	Sheen	N/A	N/A
NC023ASC	Phase 1 USEPA-Identified	74	174	N/A	None	N/A	N/A
NC023ASC	Phase 1 USEPA-Identified	174	230	N/A	Sheen	N/A	N/A
NC023ASC	Phase 1 USEPA-Identified	230	283	N/A	None	N/A	N/A
NC030BSC	Phase 1 USEPA-Identified	0	2	N/A	None	N/A	N/A
NC030BSC	Phase 1 USEPA-Identified	2	29	N/A	None	N/A	N/A
NC030BSC	Phase 1 USEPA-Identified	29	139	N/A	None	N/A	N/A
NC030BSC	Phase 1 USEPA-Identified	139	160	N/A	Oil-stained	N/A	N/A
NC030BSC	Phase 1 USEPA-Identified	160	244	N/A	None	N/A	N/A
NC032ASC	Phase 1 USEPA-Identified	0	13	N/A	None	N/A	N/A
NC032ASC	Phase 1 USEPA-Identified	13	62	N/A	None	N/A	N/A
NC032ASC	Phase 1 USEPA-Identified	62	69	N/A	Oil-wetted	N/A	N/A
NC032ASC	Phase 1 USEPA-Identified	69	302	N/A	Oil-coated	N/A	N/A
NC032ASC	Phase 1 USEPA-Identified	302	316	N/A	None	N/A	N/A
NC032ASC	Phase 1 USEPA-Identified	338	406	N/A	None	N/A	N/A
NC036BSC	Phase 1 USEPA-Identified	0	16	N/A	None	N/A	N/A
NC036BSC	Phase 1 USEPA-Identified	16	85	N/A	Oil-stained	N/A	N/A
NC036BSC	Phase 1 USEPA-Identified	85	193	N/A	Oil-stained	N/A	N/A
NC036BSC	Phase 1 USEPA-Identified	193	322	N/A	None	N/A	N/A
NC036CSC	Phase 1 USEPA-Identified	0	35	N/A	None	N/A	N/A
NC036CSC	Phase 1 USEPA-Identified	35	142	N/A	Oil-stained	N/A	N/A
NC036CSC	Phase 1 USEPA-Identified	142	145	N/A	Oil-coated	N/A	N/A
NC036CSC	Phase 1 USEPA-Identified	145	345	N/A	None	N/A	N/A
NC037ASC	Phase 1 USEPA-Identified	0	2	N/A	None	N/A	N/A
NC037ASC	Phase 1 USEPA-Identified	2	64	N/A	None	N/A	N/A
NC037ASC	Phase 1 USEPA-Identified	64	74	N/A	None	N/A	N/A
NC037ASC	Phase 1 USEPA-Identified	74	153	N/A	Oil-stained	N/A	N/A
NC037ASC	Phase 1 USEPA-Identified	153	222	N/A	None	N/A	N/A

Table C3-4
Detailed Visual and Shake Test Observations by Depth for Cores Processed Using Phase 1 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC044ASC	Phase 1 USEPA-Identified	0	2	N/A	None	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	2	72	N/A	None	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	72	117	N/A	Oil-wetted	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	117	146	N/A	Oil-coated	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	146	161	N/A	Oil-stained	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	161	178	N/A	Oil-coated	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	178	185	N/A	None	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	185	186	N/A	Oil-coated	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	186	496	N/A	None	N/A	N/A
NC045BSC	Phase 1 USEPA-Identified	0	63	N/A	None	N/A	N/A
NC045BSC	Phase 1 USEPA-Identified	63	119	N/A	Oil-stained	N/A	N/A
NC045BSC	Phase 1 USEPA-Identified	119	240	N/A	None	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	0	37	N/A	Oil-stained	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	37	193	N/A	Oil-stained	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	193	194	193	Oil-coated	Layer	NB
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	194	205	N/A	Oil-stained	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	205	206	N/A	Oil-coated	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	206	247	N/A	Oil-stained	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	247	248	N/A	Oil-coated	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	248	266	N/A	Oil-stained	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	266	270	N/A	None	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	270	274	N/A	Oil-stained	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	274	522	N/A	None	N/A	N/A
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	0	107	N/A	None	N/A	N/A
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	107	246	N/A	Oil-stained	N/A	N/A
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	246	246	246	Oil-coated	Layer	NB
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	246	267	N/A	Oil-coated	N/A	N/A
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	267	288	N/A	None	N/A	N/A
NC051ASC	Phase 1 USEPA-Identified	2	84	N/A	None	N/A	N/A
NC051ASC	Phase 1 USEPA-Identified	84	150	N/A	None	N/A	N/A
NC051ASC	Phase 1 USEPA-Identified	150	184	N/A	Oil-stained	N/A	N/A
NC051ASC	Phase 1 USEPA-Identified	184	186	N/A	None	N/A	N/A
NC051ASC	Phase 1 USEPA-Identified	186	322	N/A	Oil-stained	N/A	N/A
NC051ASC	Phase 1 USEPA-Identified	322	395	N/A	None	N/A	N/A
NC055ASC	Phase 1 USEPA-Identified	2	61	N/A	None	N/A	N/A
NC055ASC	Phase 1 USEPA-Identified	61	159	N/A	None	N/A	N/A
NC055ASC	Phase 1 USEPA-Identified	159	189	N/A	Oil-stained	N/A	N/A
NC055ASC	Phase 1 USEPA-Identified	189	414	N/A	None	N/A	N/A
NC069ASC	Phase 1 USEPA-Identified	0	27	N/A	None	N/A	N/A
NC069ASC	Phase 1 USEPA-Identified	27	204	N/A	None	N/A	N/A
NC069ASC	Phase 1 USEPA-Identified	204	262	N/A	None	N/A	N/A
NC069ASC	Phase 1 USEPA-Identified	262	274	N/A	Oil-stained	N/A	N/A
NC069ASC	Phase 1 USEPA-Identified	274	319	N/A	None	N/A	N/A
NC069ASC	Phase 1 USEPA-Identified	319	484	N/A	None	N/A	N/A
NC071CSC	Phase 1 Shake Tested	0	23	N/A	None	N/A	N/A
NC071CSC	Phase 1 Shake Tested	23	82	N/A	None	N/A	N/A
NC071CSC	Phase 1 Shake Tested	82	158	N/A	None	N/A	N/A
NC071CSC	Phase 1 Shake Tested	158	261	N/A	Oil-stained	N/A	N/A
NC071CSC	Phase 1 Shake Tested	261	263	261	Oil-wetted	Sheen	NB
NC071CSC	Phase 1 Shake Tested	263	442	N/A	Oil-stained	N/A	N/A
NC071CSC	Phase 1 Shake Tested	442	490	N/A	None	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	4	28	N/A	None	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	28	150	N/A	Oil-stained	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	150	156	N/A	Oil-wetted	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	156	190	N/A	Oil-stained	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	190	242	N/A	None	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	242	486	N/A	None	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	486	570	N/A	None	N/A	N/A

Notes:
For depth intervals in cores with no observations reported, no sediment was recovered within those depth intervals.
Visual Observation = Observations described as none, sheen, oil-stained, oil-coated, or oil-wetted are based on Phase 1 field methods (Anchor QEA 2012).
Shake Test Result = The observation made following shake test completion to identify the presence of a sheen, NAPL blebs, or a NAPL layer.

Acronym:
cm = centimeter
N/A = not applicable, shake test or visual observation not conducted
NAPL = nonaqueous phase liquid
NB = no blebs observed in shake test
USEPA = U.S. Environmental Protection Agency

Reference:
Anchor QEA (Anchor QEA, LLC), 2012. *Field Sampling and Analysis Plan Addendum 1* . Newtown Creek Remedial Investigation/Feasibility Study. April 2012.

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
DK012SC-A	Phase 2 Groundwater	0	76	N/A	None	N/A	N/A
DK012SC-A	Phase 2 Groundwater	152	253	242	Sheen	Sheen	NB
DK012SC-A	Phase 2 Groundwater	305	375	N/A	Sheen	N/A	N/A
DK012SC-A	Phase 2 Groundwater	457	506	N/A	Sheen	N/A	N/A
DK012SC-A	Phase 2 Groundwater	610	741	620	None	Negative	NB
DK012SC-A	Phase 2 Groundwater	762	914	N/A	None	N/A	N/A
DK033SC-A	Phase 2 Subsurface	0	50	50	None	Negative	NB
DK033SC-A	Phase 2 Subsurface	50	160	160	None	Negative	NB
DK033SC-A	Phase 2 Subsurface	160	310	250	None	Negative	NB
DK033SC-D	Phase 2 Subsurface	0	13	N/A	None	N/A	N/A
DK033SC-D	Phase 2 Subsurface	13	320	N/A	None	N/A	N/A
DK033SC-G	Phase 2 Subsurface	0	21	10	Sheen	Sheen	NB
DK033SC-G	Phase 2 Subsurface	21	85	N/A	None	N/A	N/A
DK033SC-G	Phase 2 Subsurface	85	138	100	Sheen	Negative	NB
DK033SC-G	Phase 2 Subsurface	138	140	N/A	None	N/A	N/A
DK033SC-G	Phase 2 Subsurface	140	170	N/A	Sheen	N/A	N/A
DK033SC-G	Phase 2 Subsurface	170	210	N/A	None	N/A	N/A
DK033SC-G	Phase 2 Subsurface	210	230	225	Sheen	Negative	NB
DK033SC-G	Phase 2 Subsurface	230	270	N/A	None	N/A	N/A
DK033SC-G	Phase 2 Subsurface	270	320	300	Sheen	Negative	NB
DK033SC-G	Phase 2 Subsurface	320	334	N/A	None	N/A	N/A
DK037SC-A	Phase 2 Subsurface	0	50	40	Sheen	Sheen	NB
DK037SC-A	Phase 2 Subsurface	50	120	N/A	None	N/A	N/A
DK037SC-B	Phase 2 Subsurface	0	85	N/A	Sheen	N/A	N/A
DK037SC-B	Phase 2 Subsurface	85	117	N/A	None	N/A	N/A
DK037SC-E	Phase 2 Subsurface	0	45	N/A	Sheen	N/A	N/A
DK037SC-E	Phase 2 Subsurface	45	110	N/A	None	N/A	N/A
DK041SC-A	Phase 2 Groundwater	0	24	N/A	None	N/A	N/A
DK041SC-A	Phase 2 Groundwater	152	195	N/A	None	N/A	N/A
DK041SC-A	Phase 2 Groundwater	305	314	307	Sheen	Sheen	NB
DK041SC-A	Phase 2 Groundwater	528	544	N/A	None	N/A	N/A
DK041SC-A	Phase 2 Groundwater	544	584	N/A	None	N/A	N/A
DK041SC-A	Phase 2 Groundwater	584	625	N/A	None	N/A	N/A
DK041SC-A	Phase 2 Groundwater	625	762	N/A	None	N/A	N/A
DK041SC-A	Phase 2 Groundwater	762	911	N/A	None	N/A	N/A
DK042SC-A	Phase 2 Groundwater	0	165	N/A	None	N/A	N/A
DK042SC-A	Phase 2 Groundwater	183	200	N/A	None	N/A	N/A
DK042SC-A	Phase 2 Groundwater	200	220	213	Sheen	Sheen	NB
DK042SC-A	Phase 2 Groundwater	220	253	N/A	None	N/A	N/A
DK042SC-A	Phase 2 Groundwater	366	446	N/A	None	N/A	N/A
DK042SC-A	Phase 2 Groundwater	446	466	N/A	None	N/A	N/A
DK042SC-A	Phase 2 Groundwater	518	645	N/A	None	N/A	N/A
DK042SC-A	Phase 2 Groundwater	671	732	N/A	None	N/A	N/A
DK043SC-A	Phase 2 Groundwater	0	120	60	None	Negative	NB
DK043SC-A	Phase 2 Groundwater	120	229	N/A	None	N/A	N/A
DK043SC-A	Phase 2 Groundwater	244	298	N/A	None	N/A	N/A
DK043SC-A	Phase 2 Groundwater	396	417	N/A	None	N/A	N/A
DK043SC-A	Phase 2 Groundwater	549	613	N/A	None	N/A	N/A
DK043SC-A	Phase 2 Groundwater	701	719	N/A	None	N/A	N/A
DK043SC-A	Phase 2 Groundwater	719	828	N/A	None	N/A	N/A
DK043SC-A	Phase 2 Groundwater	853	1,000	1000	None	Negative	NB
DK044SC-A	Phase 2 Groundwater	0	142	N/A	None	N/A	N/A
DK044SC-A	Phase 2 Groundwater	152	216	172	Sheen	Sheen	NB
DK044SC-A	Phase 2 Groundwater	305	343	N/A	Sheen	N/A	N/A
DK044SC-A	Phase 2 Groundwater	343	357	N/A	None	N/A	N/A
DK044SC-A	Phase 2 Groundwater	357	373	N/A	None	N/A	N/A
DK044SC-A	Phase 2 Groundwater	373	389	N/A	None	N/A	N/A
DK044SC-A	Phase 2 Groundwater	457	610	N/A	None	N/A	N/A
DK044SC-A	Phase 2 Groundwater	610	762	N/A	None	N/A	N/A
DK045SC-A	Phase 2 Groundwater	0	30	20	Sheen	Sheen	NB
DK045SC-A	Phase 2 Groundwater	30	55	N/A	None	N/A	N/A
DK045SC-A	Phase 2 Groundwater	229	241	N/A	Sheen	N/A	N/A
DK045SC-A	Phase 2 Groundwater	241	264	N/A	None	N/A	N/A
DK045SC-A	Phase 2 Groundwater	381	425	N/A	None	N/A	N/A
DK045SC-A	Phase 2 Groundwater	533	637	N/A	None	N/A	N/A
DK045SC-A	Phase 2 Groundwater	686	707	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	0	52	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	52	55	N/A	Sheen	N/A	N/A
DK052SC-A	Phase 2 Groundwater	55	72	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	72	77	N/A	Sheen	N/A	N/A
DK052SC-A	Phase 2 Groundwater	77	79	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	91	121	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	244	270	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
DK052SC-A	Phase 2 Groundwater	270	305	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	396	411	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	411	444	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	549	571	N/A	None	N/A	N/A
DK052SC-A	Phase 2 Groundwater	571	575	N/A	None	N/A	N/A
EB006SC-A	Phase 2 Subsurface	0	100	40	None	Negative	NB
EB006SC-A	Phase 2 Subsurface	100	123	110	Blebs	Blebs	1
EB025SC-A	Phase 2 Groundwater	0	21	N/A	None	N/A	N/A
EB025SC-A	Phase 2 Groundwater	213	296	253	None	Negative	NB
EB025SC-A	Phase 2 Groundwater	366	378	376	Sheen	Sheen	NB
EB025SC-A	Phase 2 Groundwater	378	477	N/A	None	N/A	N/A
EB025SC-A	Phase 2 Groundwater	518	671	N/A	None	N/A	N/A
EB025SC-A	Phase 2 Groundwater	671	762	N/A	None	N/A	N/A
EB040SC-A	Phase 2 Subsurface	0	187	100	None	Negative	NB
EB040SC-A	Phase 2 Subsurface	187	246	235	Sheen	Blebs	2
EB040SC-A	Phase 2 Subsurface	246	321	N/A	None	N/A	N/A
EB040SC-A	Phase 2 Subsurface	321	440	330	None	Blebs	2
EB040SC-A	Phase 2 Subsurface	440	501	480	Sheen	Sheen	NB
EB040SC-D	Phase 2 Subsurface	0	90	90	None	Negative	NB
EB040SC-D	Phase 2 Subsurface	90	290	200	None	Negative	NB
EB040SC-D	Phase 2 Subsurface	290	355	300	Sheen	Blebs	3
EB040SC-D	Phase 2 Subsurface	355	377	360	Sheen	Sheen	NB
EB040SC-D	Phase 2 Subsurface	377	406	400	Sheen	Blebs	1
EB040SC-E	Phase 2 Subsurface	0	150	100	None	Negative	NB
EB040SC-E	Phase 2 Subsurface	150	208	150	Blebs	Blebs	3
EB040SC-E	Phase 2 Subsurface	208	241	220	Sheen	Sheen	NB
EB041SC-A	Phase 2 Subsurface	0	13	13	Sheen	Sheen	NB
EB041SC-A	Phase 2 Subsurface	13	97	90	Sheen	Sheen	NB
EB041SC-A	Phase 2 Subsurface	97	177	N/A	None	N/A	N/A
EB041SC-A	Phase 2 Subsurface	177	223	200	Sheen	Sheen	NB
EB041SC-A	Phase 2 Subsurface	223	344	N/A	None	N/A	N/A
EB041SC-A	Phase 2 Subsurface	344	466	N/A	None	N/A	N/A
EB041SC-B	Phase 2 Subsurface	0	40	N/A	Sheen	N/A	N/A
EB041SC-B	Phase 2 Subsurface	40	90	N/A	None	N/A	N/A
EB041SC-B	Phase 2 Subsurface	90	240	210	Sheen	Sheen	NB
EB041SC-B	Phase 2 Subsurface	240	360	N/A	None	N/A	N/A
EB041SC-B	Phase 2 Subsurface	360	442	N/A	None	N/A	N/A
EB045SC-A	Phase 2 Subsurface	0	40	40	None	Sheen	NB
EB045SC-A	Phase 2 Subsurface	40	200	200	None	Sheen	NB
EB045SC-A	Phase 2 Subsurface	200	493	460	None	Blebs	1
EB045SC-A	Phase 2 Subsurface	493	496	493	None	Sheen	NB
EB045SC-A	Phase 2 Subsurface	496	522	510	None	Negative	NB
EB045SC-B	Phase 2 Subsurface	0	130	70	None	Sheen	NB
EB045SC-B	Phase 2 Subsurface	130	215	130	None	Sheen	NB
EB045SC-B	Phase 2 Subsurface	215	280	215	None	Sheen	NB
EB045SC-B	Phase 2 Subsurface	280	360	280	None	Sheen	NB
EB045SC-B	Phase 2 Subsurface	360	440	360	None	Sheen	NB
EB045SC-B	Phase 2 Subsurface	440	466	440	None	Sheen	NB
EB045SC-B	Phase 2 Subsurface	466	528	500	None	Negative	NB
EB046SC-A	Phase 2 Groundwater	0	229	N/A	None	N/A	N/A
EB046SC-A	Phase 2 Groundwater	396	481	N/A	None	N/A	N/A
EB046SC-A	Phase 2 Groundwater	481	515	500	None	Negative	NB
EB046SC-A	Phase 2 Groundwater	549	610	N/A	None	N/A	N/A
EB046SC-A	Phase 2 Groundwater	701	738	N/A	None	N/A	N/A
EB047SC-A	Phase 2 Groundwater	0	73	N/A	None	N/A	N/A
EB047SC-A	Phase 2 Groundwater	152	186	172	None	Negative	NB
EB047SC-A	Phase 2 Groundwater	305	320	N/A	None	N/A	N/A
EB047SC-A	Phase 2 Groundwater	320	378	N/A	None	N/A	N/A
EB048SC-A	Phase 2 Groundwater	0	76	42	Sheen	Sheen	NB
EB048SC-A	Phase 2 Groundwater	91	126	105	None	Negative	NB
EB048SC-A	Phase 2 Groundwater	152	216	N/A	None	N/A	N/A
EB048SC-A	Phase 2 Groundwater	305	380	N/A	None	N/A	N/A
EB049SC-A	Phase 2 Groundwater	0	98	N/A	None	N/A	N/A
EB049SC-A	Phase 2 Groundwater	122	166	N/A	None	N/A	N/A
EB049SC-A	Phase 2 Groundwater	274	284	N/A	None	N/A	N/A
EB050SC-A	Phase 2 Groundwater	0	160	N/A	None	N/A	N/A
EB050SC-A	Phase 2 Groundwater	160	216	160	None	Negative	NB
EB050SC-A	Phase 2 Groundwater	305	384	N/A	None	N/A	N/A
EB050SC-A	Phase 2 Groundwater	457	573	N/A	None	N/A	N/A
EB050SC-A	Phase 2 Groundwater	610	657	N/A	None	N/A	N/A
EB050SC-A	Phase 2 Groundwater	657	687	N/A	None	N/A	N/A
EB050SC-A	Phase 2 Groundwater	687	701	N/A	None	N/A	N/A
EB051SC-A	Phase 2 Groundwater	0	62	31	Sheen	Sheen	NB

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
EB051SC-A	Phase 2 Groundwater	62	107	N/A	None	N/A	N/A
EB051SC-A	Phase 2 Groundwater	152	183	N/A	Sheen	N/A	N/A
EB051SC-A	Phase 2 Groundwater	305	396	N/A	None	N/A	N/A
EB051SC-A	Phase 2 Groundwater	457	497	N/A	None	N/A	N/A
EB051SC-A	Phase 2 Groundwater	497	582	N/A	None	N/A	N/A
EB052SC-A	Phase 2 Groundwater	0	213	N/A	None	N/A	N/A
EB052SC-A	Phase 2 Groundwater	488	515	495	None	Negative	NB
EB052SC-A	Phase 2 Groundwater	640	700	N/A	None	N/A	N/A
EB052SC-A	Phase 2 Groundwater	700	710	N/A	None	N/A	N/A
EB052SC-A	Phase 2 Groundwater	792	884	N/A	None	N/A	N/A
EK003SC-B	Processed Phase 1 Archive	0	30	10	None	Negative	NB
EK003SC-B	Processed Phase 1 Archive	30	90	50	Sheen	Sheen	NB
EK003SC-B	Processed Phase 1 Archive	90	123	100	Blebs	Blebs	2
EK003SC-B	Processed Phase 1 Archive	123	220	150	None	Negative	NB
EK003SC-B	Processed Phase 1 Archive	220	281	220	None	Negative	NB
EK003SC-B	Processed Phase 1 Archive	281	286	283	Coated	Layer	NB
EK004SC-B	Processed Phase 1 Archive	0	30	20	None	Negative	NB
EK004SC-B	Processed Phase 1 Archive	30	55	45	Sheen	Sheen	NB
EK004SC-B	Processed Phase 1 Archive	55	160	100	None	Negative	NB
EK004SC-B	Processed Phase 1 Archive	160	240	160	None	Negative	NB
EK004SC-B	Processed Phase 1 Archive	240	270	240	None	Negative	NB
EK004SC-B	Processed Phase 1 Archive	270	410	310	None	Negative	NB
EK004SC-B	Processed Phase 1 Archive	410	470	410	None	Negative	NB
EK004SC-B	Processed Phase 1 Archive	470	495	470	None	Negative	NB
EK004SC-B	Processed Phase 1 Archive	495	505	N/A	Coated	N/A	N/A
EK004SC-B	Processed Phase 1 Archive	505	530	520	Saturated	Layer	NB
EK005SC-A	Processed Phase 1 Archive	0	80	30	Sheen	Sheen	NB
EK005SC-A	Processed Phase 1 Archive	80	90	90	Blebs	Blebs	2
EK005SC-A	Processed Phase 1 Archive	90	115	N/A	Sheen	N/A	N/A
EK005SC-A	Processed Phase 1 Archive	115	148	135	None	Negative	NB
EK005SC-A	Processed Phase 1 Archive	148	155	N/A	Blebs	N/A	N/A
EK005SC-A	Processed Phase 1 Archive	155	190	N/A	None	N/A	N/A
EK005SC-A	Processed Phase 1 Archive	190	211	208	Coated	Layer	NB
EK005SC-A	Processed Phase 1 Archive	211	222	N/A	None	N/A	N/A
EK005SC-A	Processed Phase 1 Archive	222	230	N/A	Coated	N/A	N/A
EK005SC-A	Processed Phase 1 Archive	230	260	235	Sheen	Sheen	NB
EK005SC-A	Processed Phase 1 Archive	260	270	260	None	Negative	NB
EK005SC-A	Processed Phase 1 Archive	275	422	360	None	Negative	NB
EK006SC-C	Phase 2 Subsurface	0	30	30	Sheen	Sheen	NB
EK006SC-C	Phase 2 Subsurface	30	108	100	Sheen	Sheen	NB
EK006SC-D	Phase 2 Subsurface	0	106	40	Sheen	Sheen	NB
EK006SC-D	Phase 2 Subsurface	106	108	N/A	Blebs	N/A	N/A
EK006SC-D	Phase 2 Subsurface	108	115	110	Coated	Layer	NB
EK007SC-B	Processed Phase 1 Archive	0	21	10	Sheen	Sheen	NB
EK007SC-B	Processed Phase 1 Archive	21	44	35	None	Sheen	NB
EK007SC-B	Processed Phase 1 Archive	59	196	80	None	Sheen	NB
EK007SC-B	Processed Phase 1 Archive	210	220	220	None	Sheen	NB
EK007SC-B	Processed Phase 1 Archive	220	380	370	None	Sheen	NB
EK007SC-B	Processed Phase 1 Archive	380	410	390	None	Negative	NB
EK007SC-B	Processed Phase 1 Archive	410	442	N/A	None	N/A	N/A
EK007SC-B	Processed Phase 1 Archive	442	480	N/A	None	N/A	N/A
EK007SC-B	Processed Phase 1 Archive	480	502	495	None	Negative	NB
EK008SC-B	Processed Phase 1 Archive	0	20	N/A	None	N/A	N/A
EK008SC-B	Processed Phase 1 Archive	20	97	30	None	Sheen	NB
EK008SC-B	Processed Phase 1 Archive	106	218	120	None	Sheen	NB
EK008SC-B	Processed Phase 1 Archive	218	228	218	None	Sheen	NB
EK008SC-B	Processed Phase 1 Archive	228	304	238	None	Negative	NB
EK008SC-B	Processed Phase 1 Archive	304	365	360	None	Negative	NB
EK008SC-B	Processed Phase 1 Archive	365	372	N/A	None	N/A	N/A
EK009SC-A	Phase 2 Groundwater	0	168	N/A	None	N/A	N/A
EK009SC-A	Phase 2 Groundwater	213	247	218	None	Sheen	NB
EK009SC-A	Phase 2 Groundwater	366	436	N/A	None	N/A	N/A
EK009SC-A	Phase 2 Groundwater	518	600	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	0	119	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	244	277	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	396	423	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	423	494	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	549	655	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	701	708	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	708	768	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	853	861	N/A	None	N/A	N/A
EK013SC-A	Phase 2 Groundwater	861	975	N/A	None	N/A	N/A
EK026SC-A	Phase 2 Groundwater	0	223	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
EK026SC-A	Phase 2 Groundwater	244	284	282	None	Negative	NB
EK026SC-A	Phase 2 Groundwater	366	390	N/A	None	N/A	N/A
EK026SC-A	Phase 2 Groundwater	390	424	N/A	None	N/A	N/A
EK026SC-A	Phase 2 Groundwater	518	588	N/A	None	N/A	N/A
EK026SC-A	Phase 2 Groundwater	671	756	N/A	None	N/A	N/A
EK036SC-A	Phase 2 Groundwater	0	46	N/A	None	N/A	N/A
EK036SC-A	Phase 2 Groundwater	152	198	196	None	Negative	NB
EK036SC-A	Phase 2 Groundwater	305	309	N/A	None	N/A	N/A
EK036SC-A	Phase 2 Groundwater	309	385	N/A	None	N/A	N/A
EK036SC-A	Phase 2 Groundwater	457	588	506	None	Negative	NB
EK036SC-A	Phase 2 Groundwater	610	762	N/A	None	N/A	N/A
EK042SC-A	Phase 2 Groundwater	0	142	N/A	None	N/A	N/A
EK042SC-A	Phase 2 Groundwater	152	188	N/A	None	N/A	N/A
EK042SC-A	Phase 2 Groundwater	213	244	230	Sheen	Negative	NB
EK042SC-A	Phase 2 Groundwater	366	405	N/A	None	N/A	N/A
EK042SC-A	Phase 2 Groundwater	405	406	N/A	Sheen	N/A	N/A
EK042SC-A	Phase 2 Groundwater	406	465	N/A	None	N/A	N/A
EK042SC-A	Phase 2 Groundwater	465	466	465	Sheen	Sheen	NB
EK042SC-A	Phase 2 Groundwater	466	470	N/A	None	N/A	N/A
EK042SC-A	Phase 2 Groundwater	518	594	520	None	Negative	NB
EK042SC-A	Phase 2 Groundwater	671	747	N/A	None	N/A	N/A
EK070SC-A	Phase 2 Groundwater	0	37	N/A	None	N/A	N/A
EK070SC-A	Phase 2 Groundwater	46	85	46	None	Sheen	NB
EK070SC-A	Phase 2 Groundwater	198	206	N/A	None	N/A	N/A
EK070SC-A	Phase 2 Groundwater	206	251	N/A	None	N/A	N/A
EK070SC-A	Phase 2 Groundwater	251	268	N/A	None	N/A	N/A
EK070SC-A	Phase 2 Groundwater	351	454	N/A	None	N/A	N/A
EK078SC-C	Phase 2 Subsurface	0	60	N/A	None	N/A	N/A
EK078SC-C	Phase 2 Subsurface	60	90	70	Blebs	Blebs	3
EK078SC-C	Phase 2 Subsurface	90	230	N/A	None	N/A	N/A
EK079SC-A	Phase 2 Subsurface	0	15	15	Sheen	Sheen	NB
EK079SC-A	Phase 2 Subsurface	15	105	100	Sheen	Sheen	NB
EK079SC-A	Phase 2 Subsurface	105	386	N/A	None	N/A	N/A
EK079SC-A	Phase 2 Subsurface	386	610	N/A	None	N/A	N/A
EK080SC-A	Phase 2 Subsurface	0	75	60	Sheen	Sheen	NB
EK080SC-A	Phase 2 Subsurface	75	272	N/A	None	N/A	N/A
EK080SC-A	Phase 2 Subsurface	272	428	N/A	None	N/A	N/A
EK080SC-A	Phase 2 Subsurface	428	431	430	Saturated	Layer	NB
EK080SC-A	Phase 2 Subsurface	431	462	N/A	None	N/A	N/A
EK081SC-A	Phase 2 Subsurface	0	54	25	Sheen	Sheen	NB
EK081SC-A	Phase 2 Subsurface	54	230	N/A	None	N/A	N/A
EK081SC-A	Phase 2 Subsurface	230	300	230	Sheen	Sheen	NB
EK081SC-A	Phase 2 Subsurface	300	500	N/A	None	N/A	N/A
EK081SC-A	Phase 2 Subsurface	500	550	N/A	None	N/A	N/A
EK081SC-B	Phase 2 Subsurface	0	60	N/A	Sheen	N/A	N/A
EK081SC-B	Phase 2 Subsurface	60	396	N/A	None	N/A	N/A
EK082SC-A	Phase 2 Subsurface	0	22	10	Sheen	Negative	NB
EK082SC-A	Phase 2 Subsurface	22	203	N/A	None	N/A	N/A
EK082SC-A	Phase 2 Subsurface	203	239	230	Sheen	Sheen	NB
EK082SC-A	Phase 2 Subsurface	239	510	N/A	None	N/A	N/A
EK082SC-B	Phase 2 Subsurface	0	230	N/A	None	N/A	N/A
EK082SC-B	Phase 2 Subsurface	230	231	N/A	Sheen	N/A	N/A
EK082SC-B	Phase 2 Subsurface	231	290	N/A	None	N/A	N/A
EK082SC-B	Phase 2 Subsurface	290	305	N/A	None	N/A	N/A
EK083SC-B	Phase 2 Subsurface	0	22	N/A	Sheen	N/A	N/A
EK083SC-B	Phase 2 Subsurface	22	230	N/A	None	N/A	N/A
EK083SC-B	Phase 2 Subsurface	230	533	N/A	Sheen	N/A	N/A
EK083SC-C	Phase 2 Subsurface	0	20	20	Sheen	Sheen	NB
EK083SC-C	Phase 2 Subsurface	20	95	N/A	None	N/A	N/A
EK083SC-C	Phase 2 Subsurface	95	110	110	Sheen	Sheen	NB
EK083SC-C	Phase 2 Subsurface	110	290	N/A	None	N/A	N/A
EK083SC-C	Phase 2 Subsurface	290	300	300	Sheen	Blebs	3
EK083SC-C	Phase 2 Subsurface	300	542	N/A	None	N/A	N/A
EK084SC-C	Phase 2 Subsurface	0	50	N/A	None	N/A	N/A
EK084SC-C	Phase 2 Subsurface	50	95	60	Sheen	Sheen	NB
EK084SC-C	Phase 2 Subsurface	95	426	N/A	None	N/A	N/A
EK084SC-C	Phase 2 Subsurface	426	554	N/A	None	N/A	N/A
EK085SC-D	Phase 2 Subsurface	0	80	30	Sheen	Sheen	NB
EK085SC-D	Phase 2 Subsurface	80	110	100	Blebs	Blebs	2
EK085SC-D	Phase 2 Subsurface	110	120	N/A	None	N/A	N/A
EK085SC-D	Phase 2 Subsurface	120	200	182	None	Negative	NB
EK085SC-D	Phase 2 Subsurface	200	300	200	None	Negative	NB
EK085SC-D	Phase 2 Subsurface	300	377	300	None	Negative	NB

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
EK089SC-A	Phase 2 Subsurface	0	80	N/A	None	N/A	N/A
EK089SC-A	Phase 2 Subsurface	80	185	80	Sheen	Sheen	NB
EK089SC-A	Phase 2 Subsurface	185	192	185	Sheen	Sheen	NB
EK089SC-A	Phase 2 Subsurface	192	195	193	Sheen	Sheen	NB
EK089SC-A	Phase 2 Subsurface	195	200	200	Sheen	Sheen	NB
EK089SC-A	Phase 2 Subsurface	200	212	N/A	Sheen	N/A	N/A
EK089SC-A	Phase 2 Subsurface	212	214	214	Sheen	Sheen	NB
EK089SC-A	Phase 2 Subsurface	214	560	240	None	Negative	NB
EK090SC-A	Phase 2 Groundwater	0	189	N/A	None	N/A	N/A
EK090SC-A	Phase 2 Groundwater	244	275	270	Sheen	Sheen	NB
EK090SC-A	Phase 2 Groundwater	275	314	300	None	Negative	NB
EK090SC-A	Phase 2 Groundwater	314	549	320	None	Negative	NB
EK091SC-A	Phase 2 Groundwater	0	130	N/A	Sheen	N/A	N/A
EK091SC-A	Phase 2 Groundwater	152	174	160	Sheen	Sheen	NB
EK091SC-A	Phase 2 Groundwater	244	250	N/A	Sheen	N/A	N/A
EK091SC-A	Phase 2 Groundwater	250	311	270	None	Negative	NB
EK091SC-A	Phase 2 Groundwater	396	457	N/A	None	N/A	N/A
EK091SC-A	Phase 2 Groundwater	457	500	N/A	None	N/A	N/A
EK091SC-A	Phase 2 Groundwater	549	604	N/A	None	N/A	N/A
EK092SC-A	Phase 2 Groundwater	0	31	N/A	None	N/A	N/A
EK092SC-A	Phase 2 Groundwater	31	58	58	None	Negative	NB
EK092SC-A	Phase 2 Groundwater	88	137	N/A	None	N/A	N/A
EK092SC-A	Phase 2 Groundwater	244	289	285	None	Negative	NB
EK092SC-A	Phase 2 Groundwater	289	338	N/A	None	N/A	N/A
EK093SC-A	Phase 2 Groundwater	0	90	N/A	None	N/A	N/A
EK093SC-A	Phase 2 Groundwater	90	91	N/A	Saturated	N/A	N/A
EK093SC-A	Phase 2 Groundwater	91	120	N/A	None	N/A	N/A
EK093SC-A	Phase 2 Groundwater	120	122	120	Blebs	Blebs	3
EK093SC-A	Phase 2 Groundwater	137	167	N/A	Blebs	N/A	N/A
EK093SC-A	Phase 2 Groundwater	167	189	189	None	Sheen	NB
EK094SC-A	Phase 2 Groundwater	0	168	N/A	None	N/A	N/A
EK094SC-A	Phase 2 Groundwater	183	200	N/A	None	N/A	N/A
EK094SC-A	Phase 2 Groundwater	200	215	N/A	None	N/A	N/A
EK094SC-A	Phase 2 Groundwater	215	230	223	Saturated	Layer	NB
EK094SC-A	Phase 2 Groundwater	230	265	N/A	Blebs	N/A	N/A
EK094SC-A	Phase 2 Groundwater	335	434	N/A	Sheen	N/A	N/A
EK094SC-A	Phase 2 Groundwater	434	701	N/A	None	N/A	N/A
EK096SC-A	Phase 2 Groundwater	0	101	N/A	None	N/A	N/A
EK096SC-A	Phase 2 Groundwater	152	165	152	None	Sheen	NB
EK096SC-A	Phase 2 Groundwater	366	380	N/A	None	N/A	N/A
EK096SC-A	Phase 2 Groundwater	380	475	N/A	None	N/A	N/A
EK096SC-A	Phase 2 Groundwater	518	574	N/A	None	N/A	N/A
EK096SC-A	Phase 2 Groundwater	574	625	N/A	None	N/A	N/A
EK096SC-A	Phase 2 Groundwater	625	655	N/A	None	N/A	N/A
EK097SC-A	Phase 2 Groundwater	0	34	N/A	None	N/A	N/A
EK097SC-A	Phase 2 Groundwater	61	82	61	None	Sheen	NB
EK097SC-A	Phase 2 Groundwater	213	226	N/A	None	N/A	N/A
EK097SC-A	Phase 2 Groundwater	226	253	N/A	None	N/A	N/A
EK097SC-A	Phase 2 Groundwater	253	283	N/A	None	N/A	N/A
EK097SC-A	Phase 2 Groundwater	366	448	N/A	None	N/A	N/A
EK098SC-D	Phase 2 Groundwater	0	122	N/A	None	N/A	N/A
EK098SC-D	Phase 2 Groundwater	122	158	N/A	None	N/A	N/A
EK098SC-D	Phase 2 Groundwater	335	354	N/A	None	N/A	N/A
EK098SC-D	Phase 2 Groundwater	354	390	N/A	None	N/A	N/A
EK098SC-D	Phase 2 Groundwater	390	436	N/A	None	N/A	N/A
EK098SC-D	Phase 2 Groundwater	488	552	N/A	None	N/A	N/A
EK098SC-D	Phase 2 Groundwater	552	604	N/A	None	N/A	N/A
EK099SC-A	Phase 2 Groundwater	0	131	N/A	None	N/A	N/A
EK099SC-A	Phase 2 Groundwater	244	270	254	Sheen	Sheen	NB
EK099SC-A	Phase 2 Groundwater	270	274	N/A	None	N/A	N/A
EK099SC-A	Phase 2 Groundwater	396	500	N/A	None	N/A	N/A
EK099SC-A	Phase 2 Groundwater	549	634	N/A	None	N/A	N/A
EK100SC-A	Phase 2 Subsurface	0	98	30	Blebs	Blebs	2
EK100SC-A	Phase 2 Subsurface	98	100	100	Blebs	Blebs	2
EK100SC-A	Phase 2 Subsurface	100	134	110	None	Negative	NB
EK100SC-A	Phase 2 Subsurface	134	136	N/A	Coated	N/A	N/A
EK100SC-A	Phase 2 Subsurface	136	141	N/A	None	N/A	N/A
EK100SC-A	Phase 2 Subsurface	141	148	144	Saturated	Layer	NB
EK100SC-A	Phase 2 Subsurface	148	200	200	None	Negative	NB
EK100SC-A	Phase 2 Subsurface	200	350	300	None	Negative	NB
EK100SC-A	Phase 2 Subsurface	350	356	352	Saturated	Layer	NB
EK100SC-A	Phase 2 Subsurface	356	390	N/A	None	N/A	N/A
EK100SC-A	Phase 2 Subsurface	390	420	400	Sheen	Sheen	NB

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
EK100SC-A	Phase 2 Subsurface	420	428	424	Saturated	Layer	NB
EK100SC-A	Phase 2 Subsurface	428	430	N/A	Sheen	N/A	N/A
EK100SC-A	Phase 2 Subsurface	430	432	N/A	Saturated	N/A	N/A
EK100SC-A	Phase 2 Subsurface	432	450	N/A	Sheen	N/A	N/A
EK100SC-A	Phase 2 Subsurface	450	451	N/A	Saturated	N/A	N/A
EK100SC-A	Phase 2 Subsurface	451	468	455	None	Negative	NB
EK100SC-A	Phase 2 Subsurface	468	469	N/A	Saturated	N/A	N/A
EK100SC-A	Phase 2 Subsurface	469	502	N/A	None	N/A	N/A
EK100SC-A	Phase 2 Subsurface	502	512	510	Saturated	Layer	NB
EK100SC-A	Phase 2 Subsurface	512	526	520	None	Negative	NB
EK101SC-A	Phase 2 Subsurface	0	85	40	Sheen	Sheen	NB
EK101SC-A	Phase 2 Subsurface	85	103	95	None	Negative	NB
EK101SC-A	Phase 2 Subsurface	103	263	180	None	Negative	NB
EK101SC-A	Phase 2 Subsurface	263	280	272	Saturated	Layer	NB
EK101SC-A	Phase 2 Subsurface	280	343	312	None	Negative	NB
EK102SC-C	Phase 2 Subsurface	0	33	30	Sheen	Sheen	NB
EK102SC-C	Phase 2 Subsurface	33	280	160	None	Sheen	NB
EK102SC-C	Phase 2 Subsurface	280	330	280	None	Sheen	NB
EK102SC-C	Phase 2 Subsurface	330	440	345	None	Negative	NB
EK102SC-C	Phase 2 Subsurface	440	563	440	None	Negative	NB
EK102SC-D	Phase 2 Subsurface	0	200	50	None	Negative	NB
EK102SC-D	Phase 2 Subsurface	200	284	250	Sheen	Sheen	NB
EK102SC-D	Phase 2 Subsurface	284	465	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	0	35	20	Sheen	Sheen	NB
EK103SC-A	Phase 2 Subsurface	35	44	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	44	100	60	Sheen	Sheen	NB
EK103SC-A	Phase 2 Subsurface	100	116	100	Sheen	Sheen	NB
EK103SC-A	Phase 2 Subsurface	116	120	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	120	121	N/A	Coated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	121	128	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	128	130	128	Coated	Layer	NB
EK103SC-A	Phase 2 Subsurface	130	133	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	133	134	N/A	Coated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	134	139	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	139	140	N/A	Coated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	140	154	148	None	Negative	NB
EK103SC-A	Phase 2 Subsurface	154	155	N/A	Coated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	155	166	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	166	168	N/A	Saturated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	168	175	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	175	182	180	Saturated	Layer	NB
EK103SC-A	Phase 2 Subsurface	182	187	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	187	189	N/A	Saturated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	189	193	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	193	193	N/A	Coated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	193	195	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	195	195	N/A	Coated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	195	200	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	200	201	200	Saturated	Layer	NB
EK103SC-A	Phase 2 Subsurface	201	204	N/A	None	N/A	N/A
EK103SC-A	Phase 2 Subsurface	204	204	N/A	Coated	N/A	N/A
EK103SC-A	Phase 2 Subsurface	204	210	208	None	Negative	NB
EK104SC-A	Phase 2 Subsurface	0	50	30	None	Negative	NB
EK104SC-A	Phase 2 Subsurface	50	100	80	Sheen	Sheen	NB
EK104SC-A	Phase 2 Subsurface	100	130	110	Blebs	Blebs	3
EK104SC-A	Phase 2 Subsurface	130	132	131	Saturated	Layer	NB
EK104SC-A	Phase 2 Subsurface	132	133	N/A	Blebs	N/A	N/A
EK104SC-A	Phase 2 Subsurface	133	148	142	None	Negative	NB
EK104SC-A	Phase 2 Subsurface	148	151	150	Saturated	Layer	NB
EK104SC-A	Phase 2 Subsurface	151	156	N/A	None	N/A	N/A
EK104SC-A	Phase 2 Subsurface	156	156	N/A	Saturated	N/A	N/A
EK104SC-A	Phase 2 Subsurface	156	225	200	None	Negative	NB
EK104SC-A	Phase 2 Subsurface	225	256	225	None	Negative	NB
EK104SC-A	Phase 2 Subsurface	256	278	256	None	Negative	NB
MC005SC-E	Phase 2 Subsurface	0	58	N/A	None	N/A	N/A
MC005SC-E	Phase 2 Subsurface	58	119	70	Blebs	Blebs	2
MC007SC-A	Phase 2 Subsurface	0	150	50	Sheen	Sheen	NB
MC007SC-A	Phase 2 Subsurface	150	210	160	Blebs	Blebs	1
MC007SC-A	Phase 2 Subsurface	210	220	210	Blebs	Blebs	1
MC007SC-A	Phase 2 Subsurface	220	240	N/A	Sheen	N/A	N/A
MC007SC-A	Phase 2 Subsurface	240	320	250	None	Negative	NB
MC007SC-A	Phase 2 Subsurface	320	345	320	Sheen	Sheen	NB
MC007SC-A	Phase 2 Subsurface	345	380	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
MC007SC-C	Phase 2 Subsurface	0	33	N/A	None	N/A	N/A
MC007SC-C	Phase 2 Subsurface	33	160	50	Blebs	Blebs	1
MC007SC-C	Phase 2 Subsurface	160	300	160	Blebs	Blebs	2
MC007SC-C	Phase 2 Subsurface	300	350	300	Blebs	Blebs	2
MC007SC-C	Phase 2 Subsurface	350	388	350	Blebs	Blebs	2
MC029SC-A	Phase 2 Groundwater	0	186	110	Sheen	Blebs	2
MC029SC-A	Phase 2 Groundwater	198	235	N/A	Sheen	N/A	N/A
MC029SC-A	Phase 2 Groundwater	351	411	N/A	Sheen	N/A	N/A
MC029SC-A	Phase 2 Groundwater	411	439	N/A	None	N/A	N/A
MC029SC-A	Phase 2 Groundwater	503	607	N/A	None	N/A	N/A
MC029SC-A	Phase 2 Groundwater	655	774	773	Sheen	Sheen	NB
MC029SC-A	Phase 2 Groundwater	808	868	N/A	Sheen	N/A	N/A
MC029SC-A	Phase 2 Groundwater	868	939	937	None	Negative	NB
MC029SC-A	Phase 2 Groundwater	960	1,000	N/A	None	N/A	N/A
MC029SC-A	Phase 2 Groundwater	1,000	1,027	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	0	185	60	Sheen	Sheen	NB
MC030SC-A	Phase 2 Groundwater	185	229	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	229	287	N/A	Sheen	N/A	N/A
MC030SC-A	Phase 2 Groundwater	381	457	N/A	Sheen	N/A	N/A
MC030SC-A	Phase 2 Groundwater	533	573	543	Sheen	Sheen	NB
MC030SC-A	Phase 2 Groundwater	573	655	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	686	733	700	Sheen	Sheen	NB
MC030SC-A	Phase 2 Groundwater	733	745	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	745	762	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	838	873	840	None	Negative	NB
MC030SC-A	Phase 2 Groundwater	873	903	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	903	961	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	961	1,011	N/A	None	N/A	N/A
MC030SC-A	Phase 2 Groundwater	1,011	1,082	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	0	40	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	244	262	257	Sheen	Sheen	NB
MC031SC-A	Phase 2 Groundwater	262	308	N/A	Sheen	N/A	N/A
MC031SC-A	Phase 2 Groundwater	396	486	446	Sheen	Sheen	NB
MC031SC-A	Phase 2 Groundwater	486	512	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	549	559	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	559	579	N/A	Sheen	N/A	N/A
MC031SC-A	Phase 2 Groundwater	579	695	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	701	734	N/A	Sheen	N/A	N/A
MC031SC-A	Phase 2 Groundwater	734	822	810	None	Negative	NB
MC031SC-A	Phase 2 Groundwater	822	832	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	853	925	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	925	985	N/A	None	N/A	N/A
MC031SC-A	Phase 2 Groundwater	985	1,003	N/A	None	N/A	N/A
NC003SC-F	Phase 2 Subsurface	0	100	60	None	Negative	NB
NC003SC-F	Phase 2 Subsurface	100	115	100	None	Negative	NB
NC012SC-C	Phase 2 Subsurface	0	14	2	None	Negative	NB
NC012SC-C	Phase 2 Subsurface	14	80	14	None	Negative	NB
NC012SC-C	Phase 2 Subsurface	80	118	80	None	Negative	NB
NC012SC-F	Phase 2 Subsurface	0	25	25	Sheen	Sheen	NB
NC012SC-F	Phase 2 Subsurface	25	100	N/A	None	N/A	N/A
NC012SC-F	Phase 2 Subsurface	100	128	100	Sheen	Sheen	NB
NC012SC-F	Phase 2 Subsurface	128	139	132	Sheen	Blebs	2
NC012SC-F	Phase 2 Subsurface	139	143	N/A	None	N/A	N/A
NC022SC-B	Processed Phase 1 Archive	0	50	30	None	Negative	NB
NC022SC-B	Processed Phase 1 Archive	50	55	N/A	Sheen	N/A	N/A
NC022SC-B	Processed Phase 1 Archive	55	116	91	Sheen	Blebs	1
NC022SC-B	Processed Phase 1 Archive	116	174	137	Sheen	Blebs	3
NC022SC-B	Processed Phase 1 Archive	174	216	183	None	Negative	NB
NC023SC-B	Processed Phase 1 Archive	0	46	N/A	None	N/A	N/A
NC023SC-B	Processed Phase 1 Archive	46	107	76	Sheen	Sheen	NB
NC023SC-B	Processed Phase 1 Archive	107	207	183	Sheen	Blebs	2
NC023SC-B	Processed Phase 1 Archive	207	241	223	None	Negative	NB
NC023SC-B	Processed Phase 1 Archive	241	274	265	None	Negative	NB
NC029SC-A	Phase 2 Groundwater	0	116	20	None	Negative	NB
NC029SC-A	Phase 2 Groundwater	116	168	152	Sheen	Sheen	NB
NC029SC-A	Phase 2 Groundwater	183	223	203	Sheen	Sheen	NB
NC029SC-A	Phase 2 Groundwater	366	446	370	None	Negative	NB
NC029SC-A	Phase 2 Groundwater	446	475	N/A	None	N/A	N/A
NC029SC-A	Phase 2 Groundwater	518	610	610	None	Negative	NB
NC036SC-A	Processed Phase 1 Archive	0	24	15	None	Negative	NB
NC036SC-A	Processed Phase 1 Archive	24	65	45	None	Sheen	NB
NC036SC-A	Processed Phase 1 Archive	65	100	85	Sheen	Sheen	NB
NC036SC-A	Processed Phase 1 Archive	100	107	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC036SC-A	Processed Phase 1 Archive	115	131	118	None	Negative	NB
NC036SC-A	Processed Phase 1 Archive	131	161	148	None	Negative	NB
NC036SC-A	Processed Phase 1 Archive	161	228	173	None	Negative	NB
NC036SC-A	Processed Phase 1 Archive	228	272	243	None	Negative	NB
NC036SC-A	Processed Phase 1 Archive	280	316	N/A	None	N/A	N/A
NC036SC-A	Processed Phase 1 Archive	316	445	363	None	Negative	NB
NC037SC-D	Phase 2 Subsurface	0	85	50	None	Negative	NB
NC037SC-D	Phase 2 Subsurface	85	112	100	Blebs	Blebs	2
NC044SC-B	Processed Phase 1 Archive	0	43	20	None	Negative	NB
NC044SC-B	Processed Phase 1 Archive	43	91	70	Sheen	Blebs	1
NC044SC-B	Processed Phase 1 Archive	101	167	137	None	Negative	NB
NC044SC-B	Processed Phase 1 Archive	167	207	197	None	Negative	NB
NC044SC-B	Processed Phase 1 Archive	207	243	N/A	None	N/A	N/A
NC044SC-B	Processed Phase 1 Archive	243	251	251	None	Negative	NB
NC044SC-B	Processed Phase 1 Archive	251	308	286	None	Negative	NB
NC044SC-B	Processed Phase 1 Archive	308	395	326	None	Negative	NB
NC045SC-A	Processed Phase 1 Archive	0	10	N/A	None	N/A	N/A
NC045SC-A	Processed Phase 1 Archive	10	58	35	None	Sheen	NB
NC045SC-A	Processed Phase 1 Archive	58	70	70	None	Blebs	2
NC045SC-A	Processed Phase 1 Archive	70	102	90	None	Sheen	NB
NC045SC-A	Processed Phase 1 Archive	102	111	102	None	Sheen	NB
NC045SC-A	Processed Phase 1 Archive	111	150	120	None	Negative	NB
NC045SC-A	Processed Phase 1 Archive	150	255	240	None	Negative	NB
NC048SC-E	Processed Phase 1 Archive	0	3	2	None	Negative	NB
NC048SC-E	Processed Phase 1 Archive	3	35	N/A	None	N/A	N/A
NC048SC-E	Processed Phase 1 Archive	35	46	35	Blebs	Sheen	NB
NC048SC-E	Processed Phase 1 Archive	59	137	82	None	Negative	NB
NC048SC-E	Processed Phase 1 Archive	137	144	N/A	None	N/A	N/A
NC048SC-E	Processed Phase 1 Archive	144	152	147	Blebs	Blebs	3
NC048SC-E	Processed Phase 1 Archive	152	174	N/A	None	N/A	N/A
NC048SC-E	Processed Phase 1 Archive	174	182	N/A	Blebs	N/A	N/A
NC048SC-E	Processed Phase 1 Archive	182	201	N/A	None	N/A	N/A
NC048SC-E	Processed Phase 1 Archive	201	227	216	None	Blebs	2
NC048SC-E	Processed Phase 1 Archive	227	258	251	None	Blebs	1
NC048SC-E	Processed Phase 1 Archive	258	281	N/A	None	N/A	N/A
NC048SC-E	Processed Phase 1 Archive	281	296	291	None	Negative	NB
NC048SC-E	Processed Phase 1 Archive	296	325	321	None	Negative	NB
NC048SC-E	Processed Phase 1 Archive	325	353	N/A	None	N/A	N/A
NC049SC-A	Processed Phase 1 Archive	0	10	4	None	Negative	NB
NC049SC-A	Processed Phase 1 Archive	10	90	30	Sheen	Sheen	NB
NC049SC-A	Processed Phase 1 Archive	90	131	122	Blebs	Blebs	1
NC050SC-B	Processed Phase 1 Archive	0	69	N/A	None	N/A	N/A
NC050SC-B	Processed Phase 1 Archive	69	88	77	Sheen	Sheen	NB
NC050SC-B	Processed Phase 1 Archive	88	110	N/A	None	N/A	N/A
NC050SC-B	Processed Phase 1 Archive	110	178	123	Sheen	Sheen	NB
NC050SC-B	Processed Phase 1 Archive	178	188	183	None	Negative	NB
NC050SC-B	Processed Phase 1 Archive	188	194	N/A	None	N/A	N/A
NC050SC-B	Processed Phase 1 Archive	194	217	N/A	None	N/A	N/A
NC050SC-B	Processed Phase 1 Archive	217	236	N/A	None	N/A	N/A
NC050SC-B	Processed Phase 1 Archive	236	265	N/A	None	N/A	N/A
NC051SC-B	Processed Phase 1 Archive	0	2	N/A	None	N/A	N/A
NC051SC-B	Processed Phase 1 Archive	2	92	45	None	Negative	NB
NC051SC-B	Processed Phase 1 Archive	104	188	112	Sheen	Blebs	2
NC051SC-B	Processed Phase 1 Archive	188	192	192	Blebs	Blebs	2
NC051SC-B	Processed Phase 1 Archive	192	214	N/A	Sheen	N/A	N/A
NC051SC-B	Processed Phase 1 Archive	214	257	240	Sheen	Sheen	NB
NC051SC-B	Processed Phase 1 Archive	257	260	N/A	None	N/A	N/A
NC051SC-B	Processed Phase 1 Archive	260	336	270	None	Negative	NB
NC055SC-B	Processed Phase 1 Archive	0	20	N/A	None	N/A	N/A
NC055SC-B	Processed Phase 1 Archive	20	58	35	Sheen	Sheen	NB
NC055SC-B	Processed Phase 1 Archive	71	144	104	None	Sheen	NB
NC055SC-B	Processed Phase 1 Archive	144	160	149	Sheen	Blebs	2
NC055SC-B	Processed Phase 1 Archive	160	196	170	None	Negative	NB
NC055SC-B	Processed Phase 1 Archive	196	334	212	None	Negative	NB
NC056SC-A	Phase 2 Groundwater	0	165	50	None	Sheen	NB
NC056SC-A	Phase 2 Groundwater	183	263	240	None	Sheen	NB
NC056SC-A	Phase 2 Groundwater	263	268	265	Sheen	Sheen	NB
NC056SC-A	Phase 2 Groundwater	268	293	N/A	None	N/A	N/A
NC056SC-A	Phase 2 Groundwater	305	439	325	None	Negative	NB
NC062SC-A	Phase 2 Groundwater	0	70	N/A	Sheen	N/A	N/A
NC062SC-A	Phase 2 Groundwater	183	244	243	Sheen	Sheen	NB
NC062SC-A	Phase 2 Groundwater	335	384	N/A	Sheen	N/A	N/A
NC062SC-A	Phase 2 Groundwater	488	533	N/A	Sheen	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC062SC-A	Phase 2 Groundwater	533	597	N/A	None	N/A	N/A
NC062SC-A	Phase 2 Groundwater	640	756	730	Sheen	Sheen	NB
NC069SC-A	Phase 2 Groundwater	0	34	N/A	None	N/A	N/A
NC069SC-A	Phase 2 Groundwater	34	113	65	Sheen	Sheen	NB
NC069SC-A	Phase 2 Groundwater	122	174	N/A	None	N/A	N/A
NC069SC-A	Phase 2 Groundwater	305	381	N/A	None	N/A	N/A
NC069SC-A	Phase 2 Groundwater	457	475	N/A	Blebs	N/A	N/A
NC069SC-A	Phase 2 Groundwater	475	479	479	Saturated	Blebs	4
NC069SC-A	Phase 2 Groundwater	479	490	483	None	Sheen	NB
NC069SC-A	Phase 2 Groundwater	490	500	N/A	Blebs	N/A	N/A
NC069SC-A	Phase 2 Groundwater	610	640	610	None	Negative	NB
NC069SC-A	Phase 2 Groundwater	640	677	N/A	None	N/A	N/A
NC069SC-A	Phase 2 Groundwater	762	811	810	None	Negative	NB
NC069SC-B	Processed Phase 1 Archive	0	70	40	None	Sheen	NB
NC069SC-B	Processed Phase 1 Archive	70	115	90	Sheen	Sheen	NB
NC069SC-B	Processed Phase 1 Archive	134	209	159	None	Blebs	1
NC069SC-B	Processed Phase 1 Archive	209	249	224	Sheen	Blebs	1
NC069SC-B	Processed Phase 1 Archive	249	300	287	None	Negative	NB
NC069SC-B	Processed Phase 1 Archive	300	322	316	None	Sheen	NB
NC069SC-B	Processed Phase 1 Archive	322	324	322	Coated	Layer	NB
NC069SC-B	Processed Phase 1 Archive	324	348	347	None	Negative	NB
NC069SC-B	Processed Phase 1 Archive	348	447	N/A	None	N/A	N/A
NC069SC-B	Processed Phase 1 Archive	447	574	462	None	Negative	NB
NC071SC-B	Phase 2 Subsurface	0	60	30	Sheen	Sheen	NB
NC071SC-B	Phase 2 Subsurface	60	120	65	Sheen	Sheen	NB
NC071SC-B	Phase 2 Subsurface	120	129	120	Sheen	Sheen	NB
NC072SC-B	Processed Phase 1 Archive	0	27	15	Sheen	Sheen	NB
NC072SC-B	Processed Phase 1 Archive	27	120	80	Sheen	Blebs	1
NC072SC-B	Processed Phase 1 Archive	120	131	N/A	Sheen	N/A	N/A
NC072SC-B	Processed Phase 1 Archive	151	180	N/A	Sheen	N/A	N/A
NC072SC-B	Processed Phase 1 Archive	180	290	220	Sheen	Sheen	NB
NC072SC-B	Processed Phase 1 Archive	290	296	290	Sheen	Sheen	NB
NC072SC-B	Processed Phase 1 Archive	296	301	299	Coated	Blebs	3
NC072SC-B	Processed Phase 1 Archive	301	319	N/A	None	N/A	N/A
NC072SC-B	Processed Phase 1 Archive	319	320	N/A	None	N/A	N/A
NC072SC-B	Processed Phase 1 Archive	320	325	N/A	None	N/A	N/A
NC072SC-B	Processed Phase 1 Archive	325	329	N/A	Coated	N/A	N/A
NC072SC-B	Processed Phase 1 Archive	329	360	340	None	Negative	NB
NC072SC-B	Processed Phase 1 Archive	360	373	360	Coated	Layer	NB
NC072SC-B	Processed Phase 1 Archive	373	388	380	None	Negative	NB
NC072SC-B	Processed Phase 1 Archive	388	436	400	None	Negative	NB
NC073SC-A	Processed Phase 1 Archive	0	30	10	Sheen	Sheen	NB
NC073SC-A	Processed Phase 1 Archive	30	98	50	Sheen	Sheen	NB
NC073SC-A	Processed Phase 1 Archive	107	120	N/A	Sheen	N/A	N/A
NC073SC-A	Processed Phase 1 Archive	120	160	140	Sheen	Sheen	NB
NC073SC-A	Processed Phase 1 Archive	160	173	N/A	Blebs	N/A	N/A
NC073SC-A	Processed Phase 1 Archive	173	182	175	None	Blebs	2
NC073SC-A	Processed Phase 1 Archive	182	190	N/A	None	N/A	N/A
NC073SC-A	Processed Phase 1 Archive	190	250	200	None	Sheen	NB
NC073SC-A	Processed Phase 1 Archive	250	287	N/A	None	N/A	N/A
NC073SC-A	Processed Phase 1 Archive	287	292	N/A	None	N/A	N/A
NC073SC-A	Processed Phase 1 Archive	292	315	310	None	Negative	NB
NC073SC-A	Processed Phase 1 Archive	315	360	N/A	None	N/A	N/A
NC073SC-A	Processed Phase 1 Archive	360	403	390	None	Negative	NB
NC073SC-A	Processed Phase 1 Archive	403	460	N/A	None	N/A	N/A
NC073SC-A	Processed Phase 1 Archive	460	486	475	None	Negative	NB
NC073SC-A	Processed Phase 1 Archive	486	555	505	None	Negative	NB
NC074SC-B	Processed Phase 1 Archive	0	5	2	Sheen	Sheen	NB
NC074SC-B	Processed Phase 1 Archive	5	23	20	None	Sheen	NB
NC074SC-B	Processed Phase 1 Archive	23	40	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	40	50	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	59	80	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	80	108	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	108	195	120	None	Sheen	NB
NC074SC-B	Processed Phase 1 Archive	195	204	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	207	222	210	None	Sheen	NB
NC074SC-B	Processed Phase 1 Archive	222	230	224	None	Sheen	NB
NC074SC-B	Processed Phase 1 Archive	230	246	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	246	280	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	280	290	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	290	300	293	None	Sheen	NB
NC074SC-B	Processed Phase 1 Archive	300	317	305	None	Negative	NB
NC074SC-B	Processed Phase 1 Archive	317	319	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC074SC-B	Processed Phase 1 Archive	319	355	330	None	Negative	NB
NC074SC-B	Processed Phase 1 Archive	362	400	N/A	None	N/A	N/A
NC074SC-B	Processed Phase 1 Archive	400	454	420	None	Negative	NB
NC074SC-B	Processed Phase 1 Archive	454	466	454	None	Negative	NB
NC074SC-B	Processed Phase 1 Archive	466	508	N/A	None	N/A	N/A
NC075SC-A	Phase 2 Groundwater	0	211	129	Blebs	Blebs	5
NC075SC-A	Phase 2 Groundwater	211	244	211	Blebs	Blebs	2
NC075SC-A	Phase 2 Groundwater	244	304	N/A	Blebs	N/A	N/A
NC075SC-A	Phase 2 Groundwater	304	335	N/A	Coated	N/A	N/A
NC075SC-A	Phase 2 Groundwater	396	494	413	Coated	Layer	NB
NC075SC-A	Phase 2 Groundwater	549	572	565	None	Negative	NB
NC154SC-D	Phase 2 Subsurface	0	90	50	None	Negative	NB
NC154SC-D	Phase 2 Subsurface	90	122	90	None	Negative	NB
NC161SC-A	Phase 2 Subsurface	0	116	100	None	Negative	NB
NC161SC-B	Phase 2 Subsurface	0	120	40	None	Negative	NB
NC161SC-B	Phase 2 Subsurface	120	135	120	None	Negative	NB
NC161SC-C	Phase 2 Subsurface	0	127	110	None	Negative	NB
NC169SC-C	Phase 2 Subsurface	0	20	N/A	None	N/A	N/A
NC169SC-C	Phase 2 Subsurface	20	48	40	Sheen	Negative	NB
NC169SC-C	Phase 2 Subsurface	48	131	N/A	None	N/A	N/A
NC169SC-D	Phase 2 Subsurface	0	21	N/A	None	N/A	N/A
NC169SC-D	Phase 2 Subsurface	21	70	N/A	Sheen	N/A	N/A
NC169SC-D	Phase 2 Subsurface	70	106	N/A	None	N/A	N/A
NC174SC-D	Phase 2 Subsurface	0	60	20	Sheen	Sheen	NB
NC174SC-D	Phase 2 Subsurface	60	90	60	Sheen	Sheen	NB
NC174SC-D	Phase 2 Subsurface	90	113	100	Blebs	Blebs	2
NC176SC-A	Phase 2 Subsurface	0	200	N/A	None	N/A	N/A
NC176SC-A	Phase 2 Subsurface	200	225	202	Blebs	Blebs	1
NC176SC-A	Phase 2 Subsurface	227	228	228	Blebs	Blebs	2
NC176SC-A	Phase 2 Subsurface	228	244	244	Blebs	Blebs	1
NC176SC-A	Phase 2 Subsurface	244	328	315	Sheen	Sheen	NB
NC176SC-A	Phase 2 Subsurface	328	370	338	Blebs	Blebs	2
NC176SC-A	Phase 2 Subsurface	370	395	374	Sheen	Sheen	NB
NC176SC-A	Phase 2 Subsurface	395	400	396	Blebs	Blebs	2
NC176SC-A	Phase 2 Subsurface	400	442	N/A	Sheen	N/A	N/A
NC176SC-A	Phase 2 Subsurface	442	446	N/A	Blebs	N/A	N/A
NC176SC-A	Phase 2 Subsurface	446	448	N/A	Sheen	N/A	N/A
NC176SC-A	Phase 2 Subsurface	448	449	N/A	Blebs	N/A	N/A
NC176SC-A	Phase 2 Subsurface	449	530	N/A	Sheen	N/A	N/A
NC176SC-B	Phase 2 Subsurface	0	345	N/A	None	N/A	N/A
NC176SC-B	Phase 2 Subsurface	345	371	N/A	Blebs	N/A	N/A
NC176SC-B	Phase 2 Subsurface	371	377	N/A	None	N/A	N/A
NC176SC-B	Phase 2 Subsurface	377	524	N/A	None	N/A	N/A
NC218SC-A	Phase 2 Groundwater	0	49	N/A	None	N/A	N/A
NC218SC-A	Phase 2 Groundwater	183	221	185	None	Negative	NB
NC218SC-A	Phase 2 Groundwater	221	232	N/A	None	N/A	N/A
NC218SC-A	Phase 2 Groundwater	335	375	N/A	None	N/A	N/A
NC218SC-A	Phase 2 Groundwater	375	445	N/A	None	N/A	N/A
NC218SC-A	Phase 2 Groundwater	488	527	N/A	None	N/A	N/A
NC218SC-A	Phase 2 Groundwater	527	576	564	None	Negative	NB
NC229SC-A	Phase 2 Subsurface	0	25	N/A	None	N/A	N/A
NC229SC-A	Phase 2 Subsurface	25	40	30	Blebs	Blebs	2
NC229SC-A	Phase 2 Subsurface	40	75	60	Blebs	Blebs	2
NC229SC-A	Phase 2 Subsurface	75	110	80	Sheen	Sheen	NB
NC229SC-A	Phase 2 Subsurface	110	383	N/A	None	N/A	N/A
NC229SC-B	Phase 2 Subsurface	0	15	N/A	None	N/A	N/A
NC229SC-B	Phase 2 Subsurface	15	130	80	Sheen	Sheen	NB
NC229SC-B	Phase 2 Subsurface	130	420	N/A	None	N/A	N/A
NC230SC-A	Phase 2 Subsurface	0	100	N/A	None	N/A	N/A
NC230SC-A	Phase 2 Subsurface	100	160	110	Blebs	Blebs	2
NC230SC-A	Phase 2 Subsurface	160	450	N/A	None	N/A	N/A
NC230SC-B	Phase 2 Subsurface	0	130	N/A	None	N/A	N/A
NC230SC-B	Phase 2 Subsurface	130	200	130	Sheen	Sheen	NB
NC230SC-B	Phase 2 Subsurface	200	298	200	None	Sheen	NB
NC233SC-A	Phase 2 Subsurface	0	20	20	Sheen	Sheen	NB
NC233SC-A	Phase 2 Subsurface	20	163	130	Sheen	Sheen	NB
NC233SC-A	Phase 2 Subsurface	163	444	N/A	None	N/A	N/A
NC233SC-B	Phase 2 Subsurface	0	32	N/A	None	N/A	N/A
NC233SC-B	Phase 2 Subsurface	32	178	N/A	Sheen	N/A	N/A
NC233SC-B	Phase 2 Subsurface	178	211	N/A	Sheen	N/A	N/A
NC233SC-B	Phase 2 Subsurface	211	390	N/A	None	N/A	N/A
NC251SC-A	Phase 2 Subsurface	0	250	100	None	Negative	NB
NC251SC-A	Phase 2 Subsurface	250	440	250	None	Negative	NB

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC251SC-A	Phase 2 Subsurface	440	470	460	Blebs	Blebs	2
NC251SC-A	Phase 2 Subsurface	470	509	N/A	None	N/A	N/A
NC253SC-A	Phase 2 Subsurface	0	115	65	None	Negative	NB
NC253SC-A	Phase 2 Subsurface	115	126	115	None	Negative	NB
NC254SC-G	Phase 2 Subsurface	0	75	40	None	Negative	NB
NC254SC-G	Phase 2 Subsurface	75	84	80	Blebs	Blebs	3
NC254SC-G	Phase 2 Subsurface	84	114	N/A	None	N/A	N/A
NC255SC-A	Phase 2 Subsurface	0	50	10	None	Negative	NB
NC255SC-A	Phase 2 Subsurface	50	95	50	None	Negative	NB
NC255SC-A	Phase 2 Subsurface	95	107	95	None	Negative	NB
NC256SC-A	Phase 2 Subsurface	0	81	N/A	None	N/A	N/A
NC256SC-A	Phase 2 Subsurface	81	90	87	Sheen	Sheen	NB
NC256SC-A	Phase 2 Subsurface	90	100	N/A	None	N/A	N/A
NC256SC-B	Phase 2 Subsurface	0	91	10	None	Negative	NB
NC256SC-B	Phase 2 Subsurface	91	115	108	Sheen	Sheen	NB
NC256SC-G	Phase 2 Subsurface	0	85	N/A	None	N/A	N/A
NC256SC-G	Phase 2 Subsurface	85	92	N/A	Sheen	N/A	N/A
NC256SC-G	Phase 2 Subsurface	92	113	N/A	None	N/A	N/A
NC257SC-F	Phase 2 Subsurface	0	95	60	None	Negative	NB
NC257SC-F	Phase 2 Subsurface	95	120	95	None	Negative	NB
NC258SC-A	Phase 2 Subsurface	0	92	50	None	Negative	NB
NC258SC-A	Phase 2 Subsurface	92	121	102	Sheen	Blebs	1
NC258SC-A	Phase 2 Subsurface	121	188	135	Blebs	Blebs	2
NC258SC-A	Phase 2 Subsurface	188	228	219	None	Negative	NB
NC258SC-A	Phase 2 Subsurface	228	236	228	None	Negative	NB
NC258SC-D	Phase 2 Subsurface	0	52	40	Sheen	Sheen	NB
NC258SC-D	Phase 2 Subsurface	52	255	220	Sheen	Sheen	NB
NC258SC-D	Phase 2 Subsurface	255	275	N/A	None	N/A	N/A
NC258SC-E	Phase 2 Subsurface	0	58	N/A	None	N/A	N/A
NC258SC-E	Phase 2 Subsurface	58	130	65	Sheen	Sheen	NB
NC258SC-E	Phase 2 Subsurface	130	168	130	Sheen	Sheen	NB
NC258SC-E	Phase 2 Subsurface	168	206	180	None	Negative	NB
NC258SC-E	Phase 2 Subsurface	206	225	N/A	None	N/A	N/A
NC258SC-F	Phase 2 Subsurface	0	102	30	None	Negative	NB
NC258SC-F	Phase 2 Subsurface	102	145	120	Blebs	Blebs	2
NC258SC-F	Phase 2 Subsurface	145	170	145	Blebs	Blebs	2
NC258SC-F	Phase 2 Subsurface	170	238	190	Sheen	Blebs	2
NC259SC-A	Phase 2 Subsurface	0	115	45	None	Negative	NB
NC259SC-A	Phase 2 Subsurface	115	125	120	Blebs	Blebs	2
NC260SC-E	Phase 2 Subsurface	0	50	20	None	Negative	NB
NC260SC-E	Phase 2 Subsurface	50	67	50	None	Negative	NB
NC260SC-E	Phase 2 Subsurface	67	80	78	Sheen	Sheen	NB
NC261SC-A	Phase 2 Subsurface	0	90	25	None	Negative	NB
NC261SC-A	Phase 2 Subsurface	90	100	100	Blebs	Blebs	2
NC261SC-A	Phase 2 Subsurface	100	120	120	Blebs	Blebs	2
NC261SC-A	Phase 2 Subsurface	120	171	N/A	None	N/A	N/A
NC261SC-A	Phase 2 Subsurface	171	206	N/A	None	N/A	N/A
NC261SC-A	Phase 2 Subsurface	206	252	N/A	None	N/A	N/A
NC261SC-A	Phase 2 Subsurface	252	384	290	None	Negative	NB
NC262SC-A	Phase 2 Subsurface	0	112	40	None	Sheen	NB
NC262SC-A	Phase 2 Subsurface	112	128	127	Sheen	Sheen	NB
NC262SC-A	Phase 2 Subsurface	128	179	N/A	None	N/A	N/A
NC262SC-A	Phase 2 Subsurface	179	183	180	Sheen	Sheen	NB
NC262SC-A	Phase 2 Subsurface	183	195	N/A	None	N/A	N/A
NC262SC-A	Phase 2 Subsurface	195	198	197	Blebs	Layer	NB
NC262SC-A	Phase 2 Subsurface	198	358	230	None	Negative	NB
NC263SC-C	Phase 2 Subsurface	0	23	N/A	None	N/A	N/A
NC263SC-C	Phase 2 Subsurface	23	94	30	Sheen	Sheen	NB
NC263SC-C	Phase 2 Subsurface	94	103	100	Blebs	Blebs	2
NC263SC-C	Phase 2 Subsurface	103	114	N/A	None	N/A	N/A
NC263SC-C	Phase 2 Subsurface	117	175	N/A	None	N/A	N/A
NC263SC-C	Phase 2 Subsurface	175	210	190	Blebs	Blebs	2
NC263SC-C	Phase 2 Subsurface	210	236	220	Sheen	Sheen	NB
NC263SC-C	Phase 2 Subsurface	236	571	N/A	None	N/A	N/A
NC264SC-B	Phase 2 Subsurface	0	24	N/A	None	N/A	N/A
NC264SC-B	Phase 2 Subsurface	24	52	50	Blebs	Blebs	2
NC264SC-B	Phase 2 Subsurface	52	113	N/A	None	N/A	N/A
NC264SC-B	Phase 2 Subsurface	113	142	130	Sheen	Sheen	NB
NC264SC-B	Phase 2 Subsurface	142	210	N/A	None	N/A	N/A
NC264SC-B	Phase 2 Subsurface	210	260	210	Blebs	Blebs	1
NC264SC-B	Phase 2 Subsurface	260	271	260	Blebs	Blebs	2
NC264SC-B	Phase 2 Subsurface	271	384	N/A	None	N/A	N/A
NC264SC-B	Phase 2 Subsurface	384	436	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC264SC-B	Phase 2 Subsurface	436	479	460	None	Negative	NB
NC264SC-B	Phase 2 Subsurface	479	482	480	Blebs	Blebs	2
NC264SC-B	Phase 2 Subsurface	482	501	N/A	None	N/A	N/A
NC265SC-A	Phase 2 Subsurface	0	40	N/A	None	N/A	N/A
NC265SC-A	Phase 2 Subsurface	40	150	50	Sheen	Sheen	NB
NC265SC-A	Phase 2 Subsurface	150	223	150	Sheen	Sheen	NB
NC265SC-A	Phase 2 Subsurface	223	283	240	None	Negative	NB
NC265SC-A	Phase 2 Subsurface	283	285	284	Coated	Blebs	5
NC265SC-A	Phase 2 Subsurface	285	287	N/A	None	N/A	N/A
NC265SC-A	Phase 2 Subsurface	287	289	N/A	Coated	N/A	N/A
NC265SC-A	Phase 2 Subsurface	289	345	320	None	Negative	NB
NC265SC-A	Phase 2 Subsurface	345	352	345	None	Negative	NB
NC265SC-A	Phase 2 Subsurface	352	358	N/A	None	N/A	N/A
NC265SC-A	Phase 2 Subsurface	358	425	N/A	None	N/A	N/A
NC265SC-A	Phase 2 Subsurface	434	535	500	None	Negative	NB
NC265SC-A	Phase 2 Subsurface	535	576	550	None	Negative	NB
NC265SC-B	Phase 2 Subsurface	0	160	105	Sheen	Sheen	NB
NC265SC-B	Phase 2 Subsurface	160	161	N/A	Coated	N/A	N/A
NC265SC-B	Phase 2 Subsurface	161	182	N/A	Sheen	N/A	N/A
NC265SC-B	Phase 2 Subsurface	182	186	182	Coated	Blebs	3
NC265SC-B	Phase 2 Subsurface	186	191	N/A	Sheen	N/A	N/A
NC265SC-B	Phase 2 Subsurface	191	193	193	Coated	Blebs	5
NC265SC-B	Phase 2 Subsurface	193	204	N/A	Sheen	N/A	N/A
NC265SC-B	Phase 2 Subsurface	204	206	N/A	Coated	N/A	N/A
NC265SC-B	Phase 2 Subsurface	206	215	N/A	Sheen	N/A	N/A
NC265SC-B	Phase 2 Subsurface	215	278	255	None	Negative	NB
NC265SC-B	Phase 2 Subsurface	278	340	N/A	None	N/A	N/A
NC265SC-B	Phase 2 Subsurface	340	368	N/A	None	N/A	N/A
NC266SC-A	Phase 2 Groundwater	0	9	N/A	None	N/A	N/A
NC266SC-A	Phase 2 Groundwater	9	10	10	Sheen	Negative	NB
NC266SC-A	Phase 2 Groundwater	10	149	140	None	Negative	NB
NC266SC-A	Phase 2 Groundwater	152	186	N/A	None	N/A	N/A
NC266SC-A	Phase 2 Groundwater	305	365	N/A	None	N/A	N/A
NC266SC-A	Phase 2 Groundwater	365	381	N/A	None	N/A	N/A
NC266SC-A	Phase 2 Groundwater	457	517	457	None	Negative	NB
NC266SC-A	Phase 2 Groundwater	517	547	N/A	None	N/A	N/A
NC266SC-A	Phase 2 Groundwater	547	582	N/A	None	N/A	N/A
NC267SC-A	Phase 2 Groundwater	0	41	N/A	None	N/A	N/A
NC267SC-A	Phase 2 Groundwater	41	42	N/A	Sheen	N/A	N/A
NC267SC-A	Phase 2 Groundwater	42	134	133	Sheen	Negative	NB
NC267SC-A	Phase 2 Groundwater	134	135	N/A	Sheen	N/A	N/A
NC267SC-A	Phase 2 Groundwater	135	160	N/A	None	N/A	N/A
NC267SC-A	Phase 2 Groundwater	160	161	N/A	Sheen	N/A	N/A
NC267SC-A	Phase 2 Groundwater	161	162	N/A	None	N/A	N/A
NC267SC-A	Phase 2 Groundwater	213	251	N/A	None	N/A	N/A
NC267SC-A	Phase 2 Groundwater	251	271	260	Sheen	Negative	NB
NC267SC-A	Phase 2 Groundwater	366	439	N/A	Sheen	N/A	N/A
NC267SC-A	Phase 2 Groundwater	518	553	538	Sheen	Blebs	1
NC267SC-A	Phase 2 Groundwater	553	576	571	Sheen	Sheen	NB
NC267SC-A	Phase 2 Groundwater	671	701	N/A	None	N/A	N/A
NC267SC-A	Phase 2 Groundwater	701	780	N/A	None	N/A	N/A
NC267SC-A	Phase 2 Groundwater	823	914	N/A	None	N/A	N/A
NC268SC-A	Phase 2 Groundwater	0	180	N/A	None	N/A	N/A
NC268SC-A	Phase 2 Groundwater	180	201	180	Sheen	Sheen	NB
NC268SC-A	Phase 2 Groundwater	213	287	N/A	Sheen	N/A	N/A
NC268SC-A	Phase 2 Groundwater	518	530	520	Sheen	Sheen	NB
NC268SC-A	Phase 2 Groundwater	530	539	N/A	None	N/A	N/A
NC268SC-A	Phase 2 Groundwater	671	802	675	None	Negative	NB
NC268SC-A	Phase 2 Groundwater	823	860	N/A	None	N/A	N/A
NC269SC-A	Phase 2 Groundwater	0	8	N/A	None	N/A	N/A
NC269SC-A	Phase 2 Groundwater	8	21	N/A	None	N/A	N/A
NC269SC-A	Phase 2 Groundwater	21	94	60	None	Negative	NB
NC269SC-A	Phase 2 Groundwater	305	388	325	None	Negative	NB
NC269SC-A	Phase 2 Groundwater	388	401	N/A	None	N/A	N/A
NC269SC-A	Phase 2 Groundwater	401	421	N/A	None	N/A	N/A
NC269SC-A	Phase 2 Groundwater	457	522	N/A	None	N/A	N/A
NC269SC-A	Phase 2 Groundwater	522	533	N/A	None	N/A	N/A
NC270SC-D	Phase 2 Groundwater	0	4	N/A	None	N/A	N/A
NC270SC-D	Phase 2 Groundwater	4	5	5	Sheen	Sheen	NB
NC270SC-D	Phase 2 Groundwater	5	43	36	None	Negative	NB
NC270SC-D	Phase 2 Groundwater	61	101	N/A	None	N/A	N/A
NC270SC-D	Phase 2 Groundwater	101	134	N/A	None	N/A	N/A
NC270SC-D	Phase 2 Groundwater	213	347	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC270SC-D	Phase 2 Groundwater	366	427	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	0	30	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	30	45	N/A	Blebs	N/A	N/A
NC271SC-A	Phase 2 Groundwater	45	60	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	60	61	N/A	Blebs	N/A	N/A
NC271SC-A	Phase 2 Groundwater	61	75	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	75	76	N/A	Blebs	N/A	N/A
NC271SC-A	Phase 2 Groundwater	76	110	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	110	120	N/A	Blebs	N/A	N/A
NC271SC-A	Phase 2 Groundwater	120	122	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	122	182	N/A	Blebs	N/A	N/A
NC271SC-A	Phase 2 Groundwater	182	188	184	Saturated	Blebs	2
NC271SC-A	Phase 2 Groundwater	188	204	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	244	276	244	None	Negative	NB
NC271SC-A	Phase 2 Groundwater	276	296	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	296	324	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	324	456	N/A	None	N/A	N/A
NC271SC-A	Phase 2 Groundwater	456	488	N/A	None	N/A	N/A
NC271SC-B	Phase 2 Groundwater	0	67	30	Sheen	Negative	NB
NC271SC-B	Phase 2 Groundwater	67	98	84	Sheen	Negative	NB
NC271SC-B	Phase 2 Groundwater	98	128	N/A	Sheen	N/A	N/A
NC271SC-B	Phase 2 Groundwater	128	155	137	None	Negative	NB
NC271SC-C	Phase 2 Groundwater	0	91	61	Sheen	Negative	NB
NC271SC-C	Phase 2 Groundwater	91	105	N/A	Sheen	N/A	N/A
NC271SC-C	Phase 2 Groundwater	105	120	114	Sheen	Blebs	2
NC271SC-C	Phase 2 Groundwater	120	145	131	Sheen	Blebs	3
NC271SC-C	Phase 2 Groundwater	145	168	158	None	Sheen	NB
NC272SC-A	Phase 2 Groundwater	0	152	N/A	None	N/A	N/A
NC272SC-A	Phase 2 Groundwater	152	269	165	None	Negative	NB
NC272SC-A	Phase 2 Groundwater	305	363	N/A	None	N/A	N/A
NC273SC-A	Phase 2 Groundwater	305	327	320	Sheen	Sheen	NB
NC273SC-A	Phase 2 Groundwater	327	357	N/A	None	N/A	N/A
NC273SC-A	Phase 2 Groundwater	357	364	360	None	Negative	NB
NC273SC-A	Phase 2 Groundwater	457	640	N/A	None	N/A	N/A
NC275SC-A	Phase 2 Groundwater	0	70	50	Sheen	Sheen	NB
NC275SC-A	Phase 2 Groundwater	70	107	N/A	None	N/A	N/A
NC275SC-A	Phase 2 Groundwater	152	174	N/A	None	N/A	N/A
NC275SC-A	Phase 2 Groundwater	174	186	N/A	None	N/A	N/A
NC275SC-A	Phase 2 Groundwater	305	375	375	None	Negative	NB
NC276SC-A	Phase 2 Groundwater	0	22	N/A	None	N/A	N/A
NC276SC-A	Phase 2 Groundwater	22	24	N/A	Sheen	N/A	N/A
NC276SC-A	Phase 2 Groundwater	24	44	N/A	None	N/A	N/A
NC276SC-A	Phase 2 Groundwater	44	54	N/A	Sheen	N/A	N/A
NC276SC-A	Phase 2 Groundwater	54	60	N/A	None	N/A	N/A
NC276SC-A	Phase 2 Groundwater	60	110	80	Sheen	Blebs	3
NC276SC-A	Phase 2 Groundwater	110	130	N/A	None	N/A	N/A
NC276SC-A	Phase 2 Groundwater	130	180	N/A	Sheen	N/A	N/A
NC276SC-A	Phase 2 Groundwater	183	213	N/A	None	N/A	N/A
NC276SC-A	Phase 2 Groundwater	213	233	228	Sheen	Blebs	2
NC276SC-A	Phase 2 Groundwater	233	238	N/A	None	N/A	N/A
NC276SC-A	Phase 2 Groundwater	238	244	244	None	Negative	NB
NC276SC-A	Phase 2 Groundwater	259	323	N/A	None	N/A	N/A
NC276SC-A	Phase 2 Groundwater	323	472	N/A	None	N/A	N/A
NC277SC-A	Phase 2 Groundwater	0	107	N/A	Sheen	N/A	N/A
NC277SC-A	Phase 2 Groundwater	107	152	140	Blebs	Blebs	2
NC277SC-A	Phase 2 Groundwater	152	207	N/A	Sheen	N/A	N/A
NC277SC-A	Phase 2 Groundwater	244	283	N/A	Sheen	N/A	N/A
NC277SC-A	Phase 2 Groundwater	283	298	N/A	Sheen	N/A	N/A
NC277SC-A	Phase 2 Groundwater	298	329	329	None	Negative	NB
NC277SC-A	Phase 2 Groundwater	396	446	N/A	None	N/A	N/A
NC277SC-A	Phase 2 Groundwater	446	549	N/A	None	N/A	N/A
NC278SC-A	Phase 2 Groundwater	0	110	40	None	Negative	NB
NC278SC-A	Phase 2 Groundwater	110	128	112	Sheen	Blebs	2
NC278SC-A	Phase 2 Groundwater	128	137	N/A	None	N/A	N/A
NC278SC-A	Phase 2 Groundwater	152	180	N/A	None	N/A	N/A
NC278SC-A	Phase 2 Groundwater	180	274	210	None	Negative	NB
NC278SC-A	Phase 2 Groundwater	305	396	N/A	None	N/A	N/A
NC278SC-A	Phase 2 Groundwater	396	418	N/A	None	N/A	N/A
NC279SC-A	Phase 2 Groundwater	0	43	17	Sheen	Sheen	NB
NC279SC-A	Phase 2 Groundwater	305	325	N/A	Sheen	N/A	N/A
NC279SC-A	Phase 2 Groundwater	325	335	N/A	None	N/A	N/A
NC279SC-A	Phase 2 Groundwater	335	354	350	Sheen	Sheen	NB
NC279SC-A	Phase 2 Groundwater	354	361	N/A	None	N/A	N/A

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC279SC-A	Phase 2 Groundwater	361	381	N/A	None	N/A	N/A
NC279SC-A	Phase 2 Groundwater	457	693	N/A	None	N/A	N/A
NC279SC-A	Phase 2 Groundwater	693	710	N/A	None	N/A	N/A
NC279SC-A	Phase 2 Groundwater	762	782	N/A	None	N/A	N/A
NC279SC-A	Phase 2 Groundwater	782	817	N/A	None	N/A	N/A
NC280SC-A	Phase 2 Groundwater	0	27	N/A	None	N/A	N/A
NC280SC-A	Phase 2 Groundwater	152	162	N/A	None	N/A	N/A
NC280SC-A	Phase 2 Groundwater	162	201	173	None	Sheen	NB
NC280SC-A	Phase 2 Groundwater	201	229	N/A	None	N/A	N/A
NC280SC-A	Phase 2 Groundwater	305	366	N/A	None	N/A	N/A
NC281SC-A	Phase 2 Groundwater	274	324	304	Sheen	Sheen	NB
NC281SC-A	Phase 2 Groundwater	324	336	334	Sheen	Sheen	NB
NC281SC-A	Phase 2 Groundwater	336	351	N/A	None	N/A	N/A
NC281SC-A	Phase 2 Groundwater	427	503	N/A	None	N/A	N/A
NC281SC-A	Phase 2 Groundwater	579	594	N/A	None	N/A	N/A
NC282SC-A	Phase 2 Groundwater	152	170	N/A	Sheen	N/A	N/A
NC282SC-A	Phase 2 Groundwater	170	201	182	Sheen	Blebs	2
NC282SC-A	Phase 2 Groundwater	305	375	N/A	None	N/A	N/A
NC282SC-A	Phase 2 Groundwater	375	387	N/A	None	N/A	N/A
NC282SC-A	Phase 2 Groundwater	457	580	477	None	Negative	NB
NC282SC-A	Phase 2 Groundwater	580	588	N/A	None	N/A	N/A
NC284SC-A	Phase 2 Groundwater	0	100	62	Sheen	Sheen	NB
NC284SC-A	Phase 2 Groundwater	100	244	N/A	None	N/A	N/A
NC284SC-A	Phase 2 Groundwater	244	305	N/A	Sheen	N/A	N/A
NC284SC-A	Phase 2 Groundwater	396	402	N/A	None	N/A	N/A
NC284SC-A	Phase 2 Groundwater	402	442	N/A	Sheen	N/A	N/A
NC284SC-A	Phase 2 Groundwater	549	579	560	Sheen	Blebs	2
NC284SC-A	Phase 2 Groundwater	579	655	600	None	Negative	NB
NC284SC-A	Phase 2 Groundwater	701	853	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	0	128	75	None	Sheen	NB
NC286SC-A	Phase 2 Groundwater	152	192	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	305	358	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	358	369	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	457	555	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	610	750	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	762	779	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	779	828	N/A	None	N/A	N/A
NC286SC-A	Phase 2 Groundwater	828	902	840	None	Negative	NB
NC287SC-A	Phase 2 Groundwater	0	52	52	Sheen	Sheen	NB
NC287SC-A	Phase 2 Groundwater	52	210	120	Sheen	Sheen	NB
NC287SC-A	Phase 2 Groundwater	244	254	N/A	Sheen	N/A	N/A
NC287SC-A	Phase 2 Groundwater	254	335	N/A	Sheen	N/A	N/A
NC287SC-A	Phase 2 Groundwater	396	469	N/A	Sheen	N/A	N/A
NC287SC-A	Phase 2 Groundwater	549	579	N/A	Sheen	N/A	N/A
NC287SC-A	Phase 2 Groundwater	579	622	N/A	None	N/A	N/A
NC287SC-A	Phase 2 Groundwater	701	838	701	None	Negative	NB
NC287SC-A	Phase 2 Groundwater	853	975	N/A	None	N/A	N/A
NC287SC-A	Phase 2 Groundwater	975	1,003	N/A	None	N/A	N/A
NC287SC-A	Phase 2 Groundwater	1,006	1,035	N/A	None	N/A	N/A
NC287SC-A	Phase 2 Groundwater	1,035	1,043	N/A	None	N/A	N/A
NC287SC-A	Phase 2 Groundwater	1,043	1,155	N/A	None	N/A	N/A
NC288SC-A	Phase 2 Groundwater	0	238	N/A	Sheen	N/A	N/A
NC288SC-A	Phase 2 Groundwater	244	308	308	Sheen	Sheen	NB
NC288SC-A	Phase 2 Groundwater	366	412	N/A	Sheen	N/A	N/A
NC288SC-A	Phase 2 Groundwater	412	443	443	None	Negative	NB
NC288SC-A	Phase 2 Groundwater	518	671	N/A	None	N/A	N/A
NC288SC-A	Phase 2 Groundwater	671	762	N/A	None	N/A	N/A
NC295SC-A	Phase 2 Subsurface	0	104	N/A	None	N/A	N/A
NC295SC-A	Phase 2 Subsurface	152	204	N/A	None	N/A	N/A
NC295SC-A	Phase 2 Subsurface	305	341	N/A	None	N/A	N/A
NC295SC-A	Phase 2 Subsurface	457	518	494	None	Negative	NB
NC295SC-A	Phase 2 Subsurface	610	637	N/A	None	N/A	N/A
NC295SC-A	Phase 2 Subsurface	686	719	706	None	Negative	NB
NC295SC-A	Phase 2 Subsurface	762	814	N/A	None	N/A	N/A
NC295SC-A	Phase 2 Subsurface	814	829	N/A	None	N/A	N/A
NC295SC-A	Phase 2 Subsurface	914	930	925	Sheen	Sheen	NB
NC295SC-A	Phase 2 Subsurface	930	939	N/A	None	N/A	N/A
NC296SC-A	Phase 2 Groundwater	0	186	94	Sheen	Sheen	NB
NC296SC-A	Phase 2 Groundwater	213	320	N/A	Sheen	N/A	N/A
NC296SC-A	Phase 2 Groundwater	366	416	414	Coated	Layer	NB
NC296SC-A	Phase 2 Groundwater	416	426	N/A	Coated	N/A	N/A
NC296SC-A	Phase 2 Groundwater	426	475	454	Coated	Blebs	5
NC296SC-A	Phase 2 Groundwater	518	548	548	Sheen	Sheen	NB

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
NC296SC-A	Phase 2 Groundwater	548	594	578	Sheen	Sheen	NB
NC298SC-A	Phase 2 Groundwater	0	198	112	Coated	Layer	NB
NC298SC-A	Phase 2 Groundwater	396	511	491	Coated	Layer	NB
NC298SC-A	Phase 2 Groundwater	511	541	N/A	Coated	N/A	N/A
NC298SC-A	Phase 2 Groundwater	549	579	N/A	Coated	N/A	N/A
NC298SC-A	Phase 2 Groundwater	579	625	N/A	None	N/A	N/A
NC298SC-A	Phase 2 Groundwater	625	655	641	Coated	Blebs	4
NC298SC-A	Phase 2 Groundwater	701	756	728	None	Negative	NB
NC299SC-A	Phase 2 Groundwater	152	160	154	Sheen	Sheen	NB
NC299SC-A	Phase 2 Groundwater	160	204	188	None	Negative	NB
NC299SC-A	Phase 2 Groundwater	305	381	N/A	None	N/A	N/A
NC299SC-A	Phase 2 Groundwater	427	488	N/A	None	N/A	N/A
NC300SC-A	Phase 2 Groundwater	0	155	44	Sheen	Sheen	NB
NC300SC-A	Phase 2 Groundwater	213	232	N/A	Sheen	N/A	N/A
NC300SC-A	Phase 2 Groundwater	232	335	277	None	Negative	NB
NC300SC-A	Phase 2 Groundwater	457	539	N/A	None	N/A	N/A
NC306SC-C	Phase 2 Subsurface	0	160	80	None	Negative	NB
NC306SC-C	Phase 2 Subsurface	160	185	160	Blebs	Blebs	2
NC306SC-C	Phase 2 Subsurface	185	205	N/A	None	N/A	N/A
NC307SC-B	Phase 2 Subsurface	0	280	N/A	None	N/A	N/A
NC307SC-B	Phase 2 Subsurface	280	290	280	Sheen	Sheen	NB
NC307SC-B	Phase 2 Subsurface	290	440	380	None	Negative	NB
NC307SC-B	Phase 2 Subsurface	440	485	N/A	None	N/A	N/A
NC307SC-B	Phase 2 Subsurface	485	513	N/A	None	N/A	N/A
NC307SC-B	Phase 2 Subsurface	513	610	N/A	None	N/A	N/A
NC308SC-A	Phase 2 Subsurface	0	92	25	Sheen	Sheen	NB
NC308SC-A	Phase 2 Subsurface	92	200	N/A	None	N/A	N/A
NC308SC-A	Phase 2 Subsurface	200	350	270	Sheen	Sheen	NB
NC308SC-A	Phase 2 Subsurface	350	592	N/A	None	N/A	N/A
NC308SC-B	Phase 2 Subsurface	0	85	65	Sheen	Sheen	NB
NC308SC-B	Phase 2 Subsurface	85	577	N/A	None	N/A	N/A
NC309SC-A	Phase 2 Subsurface	0	180	N/A	Sheen	N/A	N/A
NC309SC-A	Phase 2 Subsurface	180	587	N/A	None	N/A	N/A
NC309SC-B	Phase 2 Subsurface	0	240	N/A	Sheen	N/A	N/A
NC309SC-B	Phase 2 Subsurface	240	607	N/A	None	N/A	N/A
NC309SC-C	Phase 2 Subsurface	0	55	25	Sheen	Sheen	NB
NC309SC-C	Phase 2 Subsurface	55	220	145	Blebs	Blebs	3
NC309SC-C	Phase 2 Subsurface	220	285	225	Sheen	Sheen	NB
NC309SC-C	Phase 2 Subsurface	285	505	N/A	None	N/A	N/A
NC309SC-C	Phase 2 Subsurface	505	590	520	Sheen	Sheen	NB
NC309SC-C	Phase 2 Subsurface	590	606	590	Sheen	Sheen	NB
NC319SC-A	Phase 2 Groundwater	0	162	37	None	Sheen	NB
NC319SC-A	Phase 2 Groundwater	244	326	N/A	None	N/A	N/A
NC319SC-A	Phase 2 Groundwater	427	454	N/A	None	N/A	N/A
NC319SC-A	Phase 2 Groundwater	579	640	640	Sheen	Sheen	NB
NC319SC-A	Phase 2 Groundwater	732	762	760	Sheen	Sheen	NB
NC319SC-A	Phase 2 Groundwater	762	778	N/A	None	N/A	N/A
NC319SC-A	Phase 2 Groundwater	778	827	827	None	Negative	NB
NC319SC-A	Phase 2 Groundwater	884	960	N/A	None	N/A	N/A
NC319SC-A	Phase 2 Groundwater	960	1,006	N/A	None	N/A	N/A
NC319SC-A	Phase 2 Groundwater	1,036	1,128	N/A	None	N/A	N/A
NC320SC-A	Phase 2 Groundwater	0	232	62	Sheen	Sheen	NB
NC320SC-A	Phase 2 Groundwater	274	323	N/A	Sheen	N/A	N/A
NC320SC-A	Phase 2 Groundwater	427	479	445	Sheen	Sheen	NB
NC320SC-A	Phase 2 Groundwater	479	503	N/A	None	N/A	N/A
NC320SC-A	Phase 2 Groundwater	579	669	N/A	None	N/A	N/A
NC320SC-A	Phase 2 Groundwater	669	692	691	None	Negative	NB
NC320SC-A	Phase 2 Groundwater	732	777	N/A	None	N/A	N/A
WC003SC-F	Phase 2 Subsurface	0	80	9	None	Negative	NB
WC003SC-F	Phase 2 Subsurface	80	92	85	Sheen	Sheen	NB
WC003SC-G	Phase 2 Subsurface	0	78	N/A	None	N/A	N/A
WC003SC-G	Phase 2 Subsurface	78	91	N/A	Sheen	N/A	N/A
WC003SC-H	Phase 2 Subsurface	0	83	N/A	None	N/A	N/A
WC003SC-H	Phase 2 Subsurface	83	91	N/A	Sheen	N/A	N/A
WC008SC-A	Phase 2 Groundwater	0	56	48	Sheen	Sheen	NB
WC008SC-A	Phase 2 Groundwater	56	165	140	None	Negative	NB
WC008SC-A	Phase 2 Groundwater	229	381	239	None	Negative	NB
WC008SC-A	Phase 2 Groundwater	381	445	N/A	None	N/A	N/A
WC012SC-B	Phase 2 Subsurface	0	60	50	Sheen	Sheen	NB
WC012SC-B	Phase 2 Subsurface	60	128	100	Sheen	Sheen	NB
WC015SC-E	Phase 2 Subsurface	0	95	25	None	Sheen	NB
WC015SC-E	Phase 2 Subsurface	95	115	100	Sheen	Sheen	NB
WC015SC-E	Phase 2 Subsurface	115	120	115	None	Negative	NB

Table C3-5
Detailed Visual and Shake Test Observations by Depth for
Cores Processed Using Phase 2 Methods

Core ID	Core Type	Start Depth (cm below mudline)	End Depth (cm below mudline)	Shake Test Depth (cm below mudline)	Visual Observation	Shake Test Result	Shake Test Bleb Rank Estimate
WC015SC-F	Phase 2 Subsurface	0	64	N/A	None	N/A	N/A
WC015SC-F	Phase 2 Subsurface	64	69	N/A	Sheen	N/A	N/A
WC015SC-F	Phase 2 Subsurface	69	83	N/A	None	N/A	N/A
WC015SC-F	Phase 2 Subsurface	83	96	N/A	Sheen	N/A	N/A
WC015SC-F	Phase 2 Subsurface	96	106	N/A	None	N/A	N/A
WC015SC-G	Phase 2 Subsurface	0	76	N/A	None	N/A	N/A
WC015SC-G	Phase 2 Subsurface	76	112	N/A	Sheen	N/A	N/A
WC017SC-A	Phase 2 Groundwater	0	30	30	None	Negative	NB
WC017SC-A	Phase 2 Groundwater	30	244	200	None	Sheen	NB
WC017SC-A	Phase 2 Groundwater	305	317	317	None	Negative	NB
WC017SC-A	Phase 2 Groundwater	317	361	N/A	Sheen	N/A	N/A
WC017SC-A	Phase 2 Groundwater	361	375	N/A	None	N/A	N/A
WC017SC-A	Phase 2 Groundwater	375	390	380	Sheen	Negative	NB
WC017SC-A	Phase 2 Groundwater	390	395	N/A	None	N/A	N/A
WC017SC-A	Phase 2 Groundwater	395	451	451	None	Negative	NB
WC017SC-A	Phase 2 Groundwater	457	513	N/A	None	N/A	N/A
WC017SC-A	Phase 2 Groundwater	513	536	N/A	None	N/A	N/A
WC017SC-A	Phase 2 Groundwater	536	584	N/A	None	N/A	N/A
WC018SC-A	Phase 2 Groundwater	0	180	30	None	Sheen	NB
WC018SC-A	Phase 2 Groundwater	180	195	180	None	Sheen	NB
WC018SC-A	Phase 2 Groundwater	457	530	476	None	Negative	NB
WC018SC-A	Phase 2 Groundwater	530	543	N/A	None	N/A	N/A
WC018SC-A	Phase 2 Groundwater	610	762	762	None	Negative	NB

Notes:
For depth intervals in cores with no observations reported, no sediment was recovered within those depth intervals.
Visual Observation = Observations described as none, sheen, blebs, coated, or saturated are based on Phase 2 field methods (Anchor QEA 2014a).
Shake Test Result = Using Phase 2 SOP NC-21 – Sediment-Water Shake Test (Anchor QEA 2014b), jar contents are observed for the presence of a sheen, NAPL blebs, or a NAPL layer.

Acronyms:
cm = centimeter
N/A = not applicable, shake test or visual observation not conducted
NAPL = nonaqueous phase liquid
NB = no blebs observed in shake test
SOP = Standard Operating Procedure

References:
Anchor QEA (Anchor QEA, LLC), 2014a. *Phase 2 Field Sampling and Analysis Plan – Volume 2 Addendum No. 1* . Remedial Investigation/Feasibility Study, Newtown Creek. July 2014.
Anchor QEA, 2014b. *Phase 2 Field Sampling and Analysis Plan – Volume 2* . Newtown Creek Remedial Investigation/Feasibility Study. November 2014.

Table C3-6
Detailed Visual Observations by Depth for National Grid Cores

Core ID	Start Depth (cm below mudline)	End Depth (cm below mudline)	Visual Observation
GPEC-GT12	0	61	Blebs
GPEC-GT12	61	122	Blebs
GPEC-GT12	122	183	None
GPEC-GT12	183	244	None
GPEC-GT12	244	305	Blebs
GPEC-GT12	305	366	Blebs
GPEC-GT12	457	518	Blebs
GPEC-GT12	610	671	Coated
GPEC-GT12	762	799	None
GPEC-GT12	914	975	None
GPEC-GT12	1,067	1,128	None
GPEC-GT12	1,219	1,280	None
GPEC-GT12	1,372	1,433	None
GPEC-GT12	1,524	1,539	Sheen
GPEC-GT12	1,539	1,585	Coated
GPEC-GT12	1,676	1,737	None
GPEC-GT12	1,829	1,890	None
GPEC-GT12	1,890	1,951	None
GPEC-GT12	1,951	2,012	None
GPEC-GT14	0	61	None
GPEC-GT14	61	122	N/A
GPEC-GT14	122	183	None
GPEC-GT14	183	244	None
GPEC-GT14	244	305	None
GPEC-GT14	305	366	None
GPEC-GT14	457	518	Coated
GPEC-GT14	610	634	Blebs
GPEC-GT14	634	732	Blebs
GPEC-GT14	762	823	None
GPEC-GT14	914	975	None
GPEC-GT14	1,067	1,109	None
GPEC-GT14	1,219	1,280	None
GPEC-GT14	1,372	1,433	None
GPEC-GT14	1,524	1,585	None
GPEC-GT16	0	61	N/A
GPEC-GT16	61	122	None
GPEC-GT16	122	183	None
GPEC-GT16	183	244	None
GPEC-GT16	244	305	None
GPEC-GT16	305	366	None
GPEC-GT16	457	518	None
GPEC-GT16	610	671	None
GPEC-GT16	762	823	None
GPEC-GT16	914	975	None
GPEC-GT16	1,067	1,128	None
GPEC-GT16	1,219	1,280	None
GPEC-GT16	1,372	1,433	None
GPEC-GT16	1,524	1,576	None
GPEC-GT16	1,576	1,585	None
GPEC-GT16	1,676	1,737	None
GPEC-GT16	1,829	1,890	None
GPEC-GT16	1,981	2,042	None
GPEC-GT16	2,134	2,195	None
GPEC-GT16	2,286	2,347	None
GPEC-GT16	2,438	2,499	None
GPEC-GT16	2,591	2,652	None
GPEC-GT16	2,743	2,804	None
GPEC-GT16	2,896	2,957	None
GPEC-GT16	3,048	3,109	None
GPEC-GT18	0	61	Sheen
GPEC-GT18	61	122	Sheen
GPEC-GT18	122	183	Sheen
GPEC-GT18	183	244	Sheen
GPEC-GT18	244	305	Sheen
GPEC-GT18	305	366	Sheen
GPEC-GT18	457	518	Blebs
GPEC-GT18	518	579	None
GPEC-GT18	610	671	None
GPEC-GT18	762	823	None
GPEC-GT18	914	975	None
GPEC-GT18	975	1,036	None
GPEC-GT18	1,067	1,128	None
GPEC-GT18	1,219	1,280	None
GPEC-GT18	1,372	1,433	None

Table C3-6
Detailed Visual Observations by Depth for National Grid Cores

Core ID	Start Depth (cm below mudline)	End Depth (cm below mudline)	Visual Observation
GPEC-GT18	1,433	1,494	None
GPEC-GT18	1,524	1,585	None
GPEC-GT18	1,676	1,698	None
GPEC-GT18	1,698	1,737	None
GPEC-GT20	0	61	Sheen
GPEC-GT20	61	122	Sheen
GPEC-GT20	122	183	Sheen
GPEC-GT20	183	244	Sheen
GPEC-GT20	244	305	Sheen
GPEC-GT20	305	366	Sheen
GPEC-GT20	366	378	Sheen
GPEC-GT20	378	427	Coated
GPEC-GT20	427	445	Coated
GPEC-GT20	445	457	Sheen
GPEC-GT20	457	488	Sheen
GPEC-GT20	488	530	None
GPEC-GT20	530	549	None
GPEC-GT20	610	671	None
GPEC-GT20	762	823	None
GPEC-GT20	823	884	None
GPEC-GT20	914	975	None
GPEC-GT20	1,067	1,128	None
GPEC-GT20	1,219	1,280	None
GPEC-GT20	1,372	1,433	None
GPEC-GT20	1,524	1,585	None
GPEC-GT20	1,676	1,737	None
GPEC-GT20	1,829	1,890	None
GPEC-GT20	1,981	2,036	None
GPEC-GT22	0	61	Sheen
GPEC-GT22	61	122	Sheen
GPEC-GT22	122	183	Sheen
GPEC-GT22	183	244	Sheen
GPEC-GT22	244	305	Sheen
GPEC-GT22	305	351	None
GPEC-GT22	351	366	Blebs
GPEC-GT22	366	427	Blebs
GPEC-GT22	427	488	None
GPEC-GT22	610	671	None
GPEC-GT22	762	823	None
GPEC-GT22	914	975	None
GPEC-GT22	1,067	1,128	N/A
GPEC-GT22	1,219	1,280	None
GPEC-GT22	1,372	1,433	None
GPEC-GT22	1,524	1,585	None
GPEC-SB110	0	152	N/A
GPEC-SB110	152	305	N/A
GPEC-SB110	305	457	None
GPEC-SB110	457	610	Coated
GPEC-SB110	610	671	N/A
GPEC-SB110	671	762	None
GPEC-SB110	762	823	None
GPEC-SB110	823	914	None
GPEC-SB110	914	975	None
GPEC-SB110	975	1,067	None
GPEC-SB110	1,067	1,128	Coated
GPEC-SB110	1,128	1,219	Blebs
GPEC-SB110	1,219	1,280	None
GPEC-SB110	1,280	1,372	None
GPEC-SB110	1,372	1,433	None
GPEC-SB110	1,433	1,524	None
GPEC-SB110	1,524	1,585	None
GPEC-SB110	1,585	1,631	None
GPEC-SB110	1,631	1,676	None
GPEC-SB110	1,676	1,737	None
GPEC-SB110	1,737	1,829	None
GPEC-SB110	1,829	1,859	None
GPEC-SB110	1,859	1,890	None
GPEC-SB110	1,890	1,981	None
GPEC-SB110	1,981	2,015	None
GPEC-SB110	2,015	2,134	None
GPEC-SB110	2,134	2,195	None
GPEC-SB110	2,195	2,286	None
GPEC-SB111	122	274	None
GPEC-SB111	274	427	Saturated
GPEC-SB111	427	579	Saturated

Table C3-6
Detailed Visual Observations by Depth for National Grid Cores

Core ID	Start Depth (cm below mudline)	End Depth (cm below mudline)	Visual Observation
GPEC-SB111	579	683	Saturated
GPEC-SB111	683	732	Saturated
GPEC-SB111	732	792	N/A
GPEC-SB111	792	884	None
GPEC-SB111	884	945	None
GPEC-SB111	945	1,036	None
GPEC-SB111	1,036	1,097	N/A
GPEC-SB111	1,097	1,189	None
GPEC-SB111	1,189	1,250	None
GPEC-SB111	1,250	1,341	N/A
GPEC-SB111	1,341	1,369	None
GPEC-SB111	1,369	1,402	None
GPEC-SB111	1,402	1,448	None
GPEC-SB111	1,448	1,494	None
GPEC-SB111	1,494	1,524	None
GPEC-SB111	1,524	1,554	None
GPEC-SB111	1,554	1,646	None
GPEC-SB111	1,646	1,707	N/A
GPEC-SB111	1,707	1,798	None
GPEC-SB111	1,798	1,859	None
GPEC-SB111	1,859	1,951	None
GPEC-SB111	1,951	2,012	None
GPEC-SB111	2,012	2,103	None
GPEC-SB111	2,103	2,164	None
GPEC-SB111	2,164	2,256	None
GPEC-SB111	2,256	2,316	N/A
GPEC-SB111	2,316	2,371	None
GPEC-SB111	2,371	2,408	None
GPEC-SB111	2,408	2,469	None
GPEC-SB112	183	335	None
GPEC-SB112	335	488	Saturated
GPEC-SB112	488	640	Saturated
GPEC-SB112	640	792	None
GPEC-SB112	792	853	N/A
GPEC-SB112	853	945	Saturated
GPEC-SB112	945	1,006	Saturated
GPEC-SB112	1,006	1,097	Sheen
GPEC-SB112	1,097	1,158	Sheen
GPEC-SB112	1,158	1,250	None
GPEC-SB112	1,250	1,311	None
GPEC-SB112	1,311	1,402	None
GPEC-SB112	1,402	1,463	None
GPEC-SB112	1,463	1,554	None
GPEC-SB112	1,554	1,615	Coated
GPEC-SB112	1,615	1,707	Saturated
GPEC-SB112	1,707	1,768	Coated
GPEC-SB112	1,768	1,859	Coated
GPEC-SB112	1,859	1,920	Blebs
GPEC-SB112	1,920	2,012	Blebs
GPEC-SB112	2,012	2,042	None
GPEC-SB112	2,042	2,164	Coated
GPEC-SB112	2,164	2,225	None
GPEC-SB112	2,225	2,316	Coated
GPEC-SB112	2,316	2,377	Sheen
GPEC-SB112	2,377	2,469	Sheen
GPEC-SB112	2,469	2,530	None
GPEC-SB112	2,530	2,621	None
GPEC-SB112	2,621	2,661	N/A
GPEC-SB112	2,661	2,710	None
GPEC-SB112	2,710	2,740	None
GPEC-SB112	2,740	2,774	None
GPEC-SB112	2,774	2,835	None
GPEC-SB112	2,835	2,926	None
GPEC-SB113	122	274	None
GPEC-SB113	274	393	None
GPEC-SB113	393	427	None
GPEC-SB113	427	579	None
GPEC-SB113	579	625	None
GPEC-SB113	625	692	None
GPEC-SB113	692	732	None
GPEC-SB113	732	884	Sheen
GPEC-SB113	884	1,036	Sheen
GPEC-SB113	1,036	1,097	N/A
GPEC-SB113	1,097	1,189	None
GPEC-SB113	1,189	1,250	N/A

Table C3-6
Detailed Visual Observations by Depth for National Grid Cores

Core ID	Start Depth (cm below mudline)	End Depth (cm below mudline)	Visual Observation
GPEC-SB113	1,250	1,341	None
GPEC-SB113	1,341	1,402	N/A
GPEC-SB113	1,402	1,494	None
GPEC-SB113	1,494	1,554	N/A
GPEC-SB113	1,554	1,646	None
GPEC-SB113	1,646	1,707	N/A
GPEC-SB113	1,707	1,798	None
GPEC-SB113	1,798	1,847	None
GPEC-SB113	1,847	1,859	None
GPEC-SB113	1,859	1,951	None
GPEC-SB113	1,951	2,012	None
GPEC-SB113	2,012	2,103	None
GPEC-SB113	2,103	2,124	N/A
GPEC-SB113	2,124	2,256	None
GPEC-SB113	2,256	2,316	None
GPEC-SB113	2,316	2,408	None
GPEC-SB113	2,408	2,469	None
GPEC-SB113	2,469	2,560	N/A
GPEC-SB113	2,560	2,713	N/A
GPEC-SB113	2,713	2,746	None
GPEC-SB113	2,746	2,838	None
GPEC-SB113	2,838	2,865	None
GPEC-SB113	2,865	3,018	None
GPEC-SB113	3,018	3,088	None
GPEC-SB113	3,088	3,170	None
GPEC-SB114	0	152	None
GPEC-SB114	152	305	None
GPEC-SB114	305	329	Coated
GPEC-SB114	329	457	None
GPEC-SB114	457	491	None
GPEC-SB114	491	610	None
GPEC-SB114	610	762	None
GPEC-SB114	762	914	None
GPEC-SB114	914	954	None
GPEC-SB114	954	1,039	None
GPEC-SB114	1,039	1,067	None
GPEC-SB114	1,067	1,128	N/A
GPEC-SB114	1,128	1,173	None
GPEC-SB114	1,173	1,219	None
GPEC-SB114	1,219	1,280	None
GPEC-SB114	1,280	1,372	None
GPEC-SB114	1,372	1,433	None
GPEC-SB114	1,433	1,524	None
GPEC-SB114	1,524	1,585	None
GPEC-SB114	1,585	1,676	None
GPEC-SB114	1,676	1,728	None
GPEC-SB114	1,728	1,829	None
GPEC-SB114	1,829	1,890	None
GPEC-SB114	1,890	1,981	None
GPEC-SB114	1,981	2,022	None
GPEC-SB114	2,022	2,134	None
GPEC-SB114	2,134	2,195	None
GPEC-SB114	2,195	2,286	None
GPEC-SB114	2,286	2,347	None
GPEC-SB114	2,347	2,414	None
GPEC-SB114	2,414	2,438	None
GPEC-SB114	2,438	2,591	None
GPEC-SED01	0	10	Sheen
GPEC-SED01	10	20	Blebs
GPEC-SED01	20	60	Sheen
GPEC-SED01	60	200	Sheen
GPEC-SED01	200	259	Sheen
GPEC-SED01	259	381	None
GPEC-SED02	0	10	Sheen
GPEC-SED02	10	100	Sheen
GPEC-SED02	100	200	Sheen
GPEC-SED02	200	289	Coated
GPEC-SED02	289	312	Blebs
GPEC-SED02	312	328	Saturated
GPEC-SED02	328	358	Coated
GPEC-SED02	358	491	None
GPEC-SED03	0	10	Sheen
GPEC-SED03	10	300	None
GPEC-SED03	300	320	None
GPEC-SED04	0	10	Sheen

Table C3-6
Detailed Visual Observations by Depth for National Grid Cores

Core ID	Start Depth (cm below mudline)	End Depth (cm below mudline)	Visual Observation
GPEC-SED04	10	20	None
GPEC-SED04	20	60	None
GPEC-SED04	60	100	None
GPEC-SED04	100	200	None
GPEC-SED04	200	251	None
GPEC-SED04	251	267	Sheen
GPEC-SED04	267	463	None
GPEC-SED05	0	10	Sheen
GPEC-SED05	10	20	Sheen
GPEC-SED05	20	60	Sheen
GPEC-SED05	60	200	Sheen
GPEC-SED05	207	238	Coated
GPEC-SED05	238	357	Coated
GPEC-SED05	357	364	Saturated
GPEC-SED05	364	402	Coated
GPEC-SED06	0	10	Sheen
GPEC-SED06	10	20	None
GPEC-SED06	20	60	None
GPEC-SED06	60	100	None
GPEC-SED06	100	200	None
GPEC-SED06	200	300	None
GPEC-SED06	300	366	Coated
GPEC-SED06	366	454	Coated
GPEC-SED07	0	10	Sheen
GPEC-SED07	10	20	Sheen
GPEC-SED07	20	60	None
GPEC-SED07	60	100	None
GPEC-SED07	100	200	Coated
GPEC-SED07	200	277	None
GPEC-SED07	277	427	None
GPEC-SED08	0	10	None
GPEC-SED08	10	20	Sheen
GPEC-SED08	20	100	None
GPEC-SED08	100	200	None
GPEC-SED08	200	282	None
GPEC-SED08	282	393	Blebs
GPEC-SED09	0	10	None
GPEC-SED09	10	60	None
GPEC-SED09	60	100	None
GPEC-SED09	100	200	None
GPEC-SED09	200	300	None
GPEC-SED09	300	351	None
GPEC-SED09	351	436	Saturated
GPEC-SED10	0	10	Sheen
GPEC-SED10	10	20	None
GPEC-SED10	20	60	None
GPEC-SED10	60	100	Saturated
GPEC-SED10	100	198	None
GPEC-SED10	198	308	None
GPEC-SED10	308	375	None
GPEC-SED11	0	10	Sheen
GPEC-SED11	10	20	Sheen
GPEC-SED11	20	60	Sheen
GPEC-SED11	60	100	None
GPEC-SED11	100	200	None
GPEC-SED11	200	229	Coated
GPEC-SED11	229	290	None
GPEC-SED12	0	10	Sheen
GPEC-SED12	10	60	None
GPEC-SED12	60	200	None
GPEC-SED12	200	264	Coated
GPEC-SED12	264	358	Coated
GPEC-SED13	0	10	Sheen
GPEC-SED13	10	60	Sheen
GPEC-SED13	60	100	None
GPEC-SED13	100	183	Coated
GPEC-SED13	183	213	Coated
GPEC-SED13	213	363	None
GPEC-SED14	0	10	Sheen
GPEC-SED14	10	20	Blebs
GPEC-SED14	20	60	Sheen
GPEC-SED14	60	100	None
GPEC-SED14	100	200	None
GPEC-SED14	200	251	Coated
GPEC-SED14	251	312	Coated

Table C3-6
Detailed Visual Observations by Depth for National Grid Cores

Core ID	Start Depth (cm below mudline)	End Depth (cm below mudline)	Visual Observation
GPEC-SED14	312	387	Sheen
GPEC-SED15	0	10	Sheen
GPEC-SED15	10	60	Sheen
GPEC-SED15	60	100	Sheen
GPEC-SED15	100	140	Blebs
GPEC-SED15	140	292	Coated
GPEC-SED16	0	10	None
GPEC-SED16	10	60	None
GPEC-SED16	60	100	None
GPEC-SED16	100	200	None
GPEC-SED16	200	230	None
GPEC-SED16	230	393	None
GPEC-SED17	0	10	Sheen
GPEC-SED17	10	60	Blebs
GPEC-SED17	60	100	None
GPEC-SED17	100	200	None
GPEC-SED17	200	289	Coated
GPEC-SED17	289	329	Saturated
GPEC-SED17	329	344	Saturated
GPEC-SED17	344	390	Saturated
GPEC-SED17	390	424	None
GPEC-SED18	0	10	None
GPEC-SED18	10	60	Sheen
GPEC-SED18	60	100	None
GPEC-SED18	100	200	Sheen
GPEC-SED18	200	289	Sheen
GPEC-SED18	289	328	Coated
GPEC-SED18	328	389	Coated
GPEC-SED18	389	472	None
GPEC-SED19	0	10	Sheen
GPEC-SED19	10	60	Sheen
GPEC-SED19	60	100	Sheen
GPEC-SED19	100	200	Sheen
GPEC-SED19	200	223	Sheen
GPEC-SED19	223	290	None
GPEC-SED19	290	393	None
GPEC-SED20	0	10	Sheen
GPEC-SED20	10	60	Sheen
GPEC-SED20	60	200	Sheen
GPEC-SED20	200	254	Blebs
GPEC-SED20	254	284	Saturated
GPEC-SED20	284	366	None
GPEC-SED21	0	10	Sheen
GPEC-SED21	10	20	None
GPEC-SED21	20	100	None
GPEC-SED21	100	137	None
GPEC-SED21	137	152	None
GPEC-SED21	152	293	None
GPEC-SED22	0	10	Sheen
GPEC-SED22	10	60	Sheen
GPEC-SED22	60	100	Sheen
GPEC-SED22	100	200	Sheen
GPEC-SED22	200	223	None
GPEC-SED22	223	351	None
GPEC-SED22	351	402	None
GPEC-SED23	0	10	Sheen
GPEC-SED23	10	46	Blebs
GPEC-SED23	46	98	Sheen
GPEC-SED23	98	107	None
GPEC-SED23	107	366	None
GPEC-SED24	0	10	None
GPEC-SED24	10	71	Sheen
GPEC-SED24	71	213	None
GPEC-SED24	213	244	None
GPEC-SED24	244	320	None
GPEC-SED25	0	10	Sheen
GPEC-SED25	10	117	Sheen
GPEC-SED25	117	254	None
GPEC-SED25	254	315	None
GPEC-SED26	0	10	Sheen
GPEC-SED26	10	117	Blebs
GPEC-SED26	117	305	None
GPEC-SED26	305	376	None
GPEC-SED27	0	10	Sheen
GPEC-SED27	10	168	None

Table C3-6
Detailed Visual Observations by Depth for National Grid Cores

Core ID	Start Depth (cm below mudline)	End Depth (cm below mudline)	Visual Observation
GPEC-SED27	168	229	Coated
GPEC-SED27	229	390	None
GPEC-SED28	0	10	Sheen
GPEC-SED28	10	450	None
GPEC-SED29	0	10	Sheen
GPEC-SED29	10	71	Sheen
GPEC-SED29	71	193	None
GPEC-SED29	193	223	Coated
GPEC-SED29	223	282	None
GPEC-SED29	282	381	None
GPEC-SED29	381	475	None
GPEC-SED30	0	10	Sheen
GPEC-SED30	10	56	Sheen
GPEC-SED30	56	236	None
GPEC-SED30	236	267	None
GPEC-SED30	267	335	None
GPEC-SED30	335	399	None
GPEC-SED31	0	10	Sheen
GPEC-SED31	10	61	Sheen
GPEC-SED31	61	71	None
GPEC-SED31	71	114	None
GPEC-SED31	114	247	None
GPEC-SED31	247	506	None

Note:
For depth intervals in cores with no observations reported, no sediment was recovered within those depth intervals.
Visual Observation = Observations described as none, sheen, blebs, coated, or saturated are based on National Grid field methods (GEI 2009).

Acronyms:
cm = centimeter
N/A = not applicable, visual observation not conducted

Reference:
GEI (GEI Consultants, Inc.), 2009. *Field Sampling Plan, Greenpoint Energy Center* . Prepared for National Grid. January 2009.

Table C3-7
Summary of Most Notable Visual and Shake Test Observations in Cores Processed Using Phase 1 Methods

Core ID	Core Type	Core Process Date	Most Notable Visual Observations			Most Notable Shake Test Observations			Maximum Shake Test Bleb Rank
			Surface Sediment	Subsurface Sediment	Native Material	Surface Sediment	Subsurface Sediment	Native Material	
EK004ASC	Phase 1 Shake Tested	6/27/2012	Oil-coated	Oil-coated	Oil-wetted	N/A	N/A	Layer	N/A
EK005BSC	Phase 1 Shake Tested	7/9/2012	None	Oil-wetted	Oil-wetted	N/A	Layer	N/A	N/A
EK007ASC	Phase 1 USEPA-Identified	6/27/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
EK009ASC	Phase 1 USEPA-Identified	6/26/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
EK009CSC	Phase 1 USEPA-Identified	6/26/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
EK018ASC	Phase 1 USEPA-Identified	6/28/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
NC016BSC	Phase 1 USEPA-Identified	5/31/2012	None	Oil-coated	None	N/A	N/A	N/A	N/A
NC022CSC	Phase 1 USEPA-Identified	5/19/2012	None	Oil-wetted	Oil-wetted	N/A	N/A	N/A	N/A
NC023ASC	Phase 1 USEPA-Identified	5/16/2012	None	Sheen	None	N/A	N/A	N/A	N/A
NC030BSC	Phase 1 USEPA-Identified	5/30/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
NC032ASC	Phase 1 USEPA-Identified	5/22/2012	None	Oil-wetted	None	N/A	N/A	N/A	N/A
NC036BSC	Phase 1 USEPA-Identified	5/23/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
NC036CSC	Phase 1 USEPA-Identified	5/23/2012	None	Oil-coated	None	N/A	N/A	N/A	N/A
NC037ASC	Phase 1 USEPA-Identified	5/21/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
NC044ASC	Phase 1 USEPA-Identified	6/1/2012	None	Oil-wetted	None	N/A	N/A	N/A	N/A
NC045BSC	Phase 1 USEPA-Identified	7/11/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	6/4/2012	Oil-stained	Oil-coated	Oil-stained	N/A	Layer	N/A	N/A
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	6/4/2012	None	Oil-stained	Oil-coated	N/A	Layer	N/A	N/A
NC051ASC	Phase 1 USEPA-Identified	7/4/2012	None	Oil-stained	Oil-stained	N/A	N/A	N/A	N/A
NC055ASC	Phase 1 USEPA-Identified	7/10/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
NC069ASC	Phase 1 USEPA-Identified	6/14/2012	None	Oil-stained	None	N/A	N/A	N/A	N/A
NC071CSC	Phase 1 Shake Tested	7/3/2012	None	Oil-wetted	NE	N/A	Sheen	N/A	N/A
NC073BSC	Phase 1 USEPA-Identified	6/13/2012	None	Oil-wetted	None	N/A	N/A	N/A	N/A

Notes:
Native Material = Material deposited prior to the physical influence of humans on the natural environment and consists of the deposits below the sediment.
None = No sheen or oil observed.
Shake Test Observations = Using Phase 2 SOP NC-21 – Sediment-Water Shake Test (Anchor QEA 2014), jar contents are observed for the presence of a sheen, NAPL blebs, or a NAPL layer.
Subsurface = Deposits below surface sediment and above the native material and represents the portion of the sediment column deposited in recent time.
Surface = Deposits within the top 6 inches below the sediment surface (i.e., mudline); it is the most recently deposited material.
Visual Observations = Observations described as none, sheen, oil-stained, oil-coated, or oil-wetted are based on Phase 1 field methods (Anchor QEA 2012).

Acronyms:
N/A = not applicable, shake test or visual observation not conducted
NAPL = nonaqueous phase liquid
NE = native material not encountered
SOP = Standard Operating Procedure
USEPA = U.S. Environmental Protection Agency

References:
Anchor QEA (Anchor QEA, LLC), 2012. *Field Sampling and Analysis Plan Addendum 1* . Newtown Creek Remedial Investigation/Feasibility Study. April 2012.
Anchor QEA, 2014. *Phase 2 Field Sampling and Analysis Plan – Volume 2* . Newtown Creek Remedial Investigation/Feasibility Study. November 2014.

Table C3-8

Summary of Most Notable Visual and Shake Test Observations in Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Most Notable Visual Observations			Most Notable Shake Test Observations			Maximum Shake Test Bleb Rank
			Surface Sediment	Subsurface Sediment	Native Material	Surface Sediment	Subsurface Sediment	Native Material	
DK012SC-A	Phase 2 Groundwater	8/1/2014	None	Sheen	None	N/A	Sheen	None	NB
DK033SC-A	Phase 2 Subsurface	7/7/2014	None	None	NE	N/A	None	NE	NB
DK033SC-D	Phase 2 Subsurface	6/18/2014	None	None	NE	N/A	N/A	NE	N/A
DK033SC-G	Phase 2 Subsurface	6/18/2014	Sheen	Sheen	NE	Sheen	None	NE	NB
DK037SC-A	Phase 2 Subsurface	6/17/2014	Sheen	Sheen	NE	N/A	Sheen	NE	NB
DK037SC-B	Phase 2 Subsurface	6/17/2014	Sheen	Sheen	NE	N/A	N/A	NE	N/A
DK037SC-E	Phase 2 Subsurface	6/17/2014	Sheen	Sheen	NE	N/A	N/A	NE	N/A
DK041SC-A	Phase 2 Groundwater	7/31/2014	None	Sheen	None	N/A	Sheen	N/A	NB
DK042SC-A	Phase 2 Groundwater	10/9/2014	None	Sheen	None	N/A	Sheen	N/A	NB
DK043SC-A	Phase 2 Groundwater	10/9/2014	None	None	None	N/A	None	None	NB
DK044SC-A	Phase 2 Groundwater	10/17/2014	None	Sheen	None	N/A	Sheen	N/A	NB
DK045SC-A	Phase 2 Groundwater	10/16/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
DK052SC-A	Phase 2 Groundwater	10/15/2014	None	Sheen	None	N/A	N/A	N/A	N/A
EB006SC-A	Phase 2 Subsurface	7/18/2014	None	Blebs	NE	N/A	Blebs	NE	1
EB025SC-A	Phase 2 Groundwater	10/29/2014	None	Sheen	None	N/A	Sheen	N/A	NB
EB040SC-A	Phase 2 Subsurface	7/17/2014	None	Sheen	NE	N/A	Blebs	NE	2
EB040SC-D	Phase 2 Subsurface	7/21/2014	None	Sheen	NE	N/A	Blebs	NE	3
EB040SC-E	Phase 2 Subsurface	7/22/2014	None	Blebs	NE	N/A	Blebs	NE	3
EB041SC-A	Phase 2 Subsurface	6/12/2014	Sheen	Sheen	None	Sheen	Sheen	N/A	NB
EB041SC-B	Phase 2 Subsurface	6/12/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
EB045SC-A	Phase 2 Subsurface	7/24/2014	None	None	None	N/A	Blebs	None	1
EB045SC-B	Phase 2 Subsurface	7/23/2014	None	None	None	N/A	Sheen	None	NB
EB046SC-A	Phase 2 Groundwater	11/10/2014	None	None	None	N/A	N/A	None	NB
EB047SC-A	Phase 2 Groundwater	11/6/2014	None	None	None	N/A	N/A	None	NB
EB048SC-A	Phase 2 Groundwater	10/31/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
EB049SC-A	Phase 2 Groundwater	10/28/2014	None	None	None	N/A	N/A	N/A	N/A
EB050SC-A	Phase 2 Groundwater	10/27/2014	None	None	None	N/A	None	N/A	NB
EB051SC-A	Phase 2 Groundwater	11/1/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
EB052SC-A	Phase 2 Groundwater	10/30/2014	None	None	None	N/A	None	N/A	NB
EK003SC-B	Processed Phase 1 Archive	7/1/2014	None	Blebs	Coated	None	Blebs	Layer	2
EK004SC-B	Processed Phase 1 Archive	6/30/2014	None	Sheen	Saturated	N/A	Sheen	Layer	NB
EK005SC-A	Processed Phase 1 Archive	7/4/2014	Sheen	Blebs	Coated	N/A	Blebs	Layer	2
EK006SC-C	Phase 2 Subsurface	7/3/2014	Sheen	Sheen	NE	N/A	Sheen	NE	NB
EK006SC-D	Phase 2 Subsurface	7/3/2014	Sheen	Coated	NE	N/A	Layer	NE	NB
EK007SC-B	Processed Phase 1 Archive	11/19/2015	Sheen	Sheen	None	Sheen	Sheen	None	NB
EK008SC-B	Processed Phase 1 Archive	11/19/2015	None	None	None	N/A	Sheen	None	NB
EK009SC-A	Phase 2 Groundwater	9/19/2014	None	None	None	N/A	Sheen	N/A	NB
EK013SC-A	Phase 2 Groundwater	9/18/2014	None	None	None	N/A	N/A	N/A	N/A
EK026SC-A	Phase 2 Groundwater	11/13/2014	None	None	None	N/A	None	N/A	NB

Table C3-8

Summary of Most Notable Visual and Shake Test Observations in Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Most Notable Visual Observations			Most Notable Shake Test Observations			Maximum Shake Test Bleb Rank
			Surface Sediment	Subsurface Sediment	Native Material	Surface Sediment	Subsurface Sediment	Native Material	
EK036SC-A	Phase 2 Groundwater	9/23/2014	None	None	None	N/A	None	None	NB
EK042SC-A	Phase 2 Groundwater	11/11/2014	None	Sheen	None	N/A	Sheen	None	NB
EK070SC-A	Phase 2 Groundwater	9/17/2014	None	None	None	N/A	Sheen	N/A	NB
EK078SC-C	Phase 2 Subsurface	6/23/2014	None	Blebs	None	N/A	Blebs	N/A	3
EK079SC-A	Phase 2 Subsurface	6/23/2014	Sheen	Sheen	None	Sheen	Sheen	N/A	NB
EK080SC-A	Phase 2 Subsurface	6/10/2014	Sheen	Sheen	Saturated	N/A	Sheen	Layer	NB
EK081SC-A	Phase 2 Subsurface	6/13/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
EK081SC-B	Phase 2 Subsurface	6/13/2014	Sheen	Sheen	NE	N/A	N/A	NE	N/A
EK082SC-A	Phase 2 Subsurface	6/11/2014	Sheen	Sheen	None	None	Sheen	N/A	NB
EK082SC-B	Phase 2 Subsurface	6/11/2014	None	Sheen	None	N/A	N/A	N/A	N/A
EK083SC-B	Phase 2 Subsurface	6/12/2014	Sheen	Sheen	NE	N/A	N/A	NE	N/A
EK083SC-C	Phase 2 Subsurface	6/12/2014	Sheen	Sheen	NE	N/A	Blebs	NE	3
EK084SC-C	Phase 2 Subsurface	6/20/2014	None	Sheen	None	N/A	Sheen	N/A	NB
EK085SC-D	Phase 2 Subsurface	7/10/2014	Sheen	Blebs	None	N/A	Blebs	None	2
EK089SC-A	Phase 2 Subsurface	7/29/2014	None	Sheen	Sheen	N/A	Sheen	Sheen	NB
EK090SC-A	Phase 2 Groundwater	8/22/2014	None	Sheen	None	N/A	Sheen	None	NB
EK091SC-A	Phase 2 Groundwater	10/1/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
EK092SC-A	Phase 2 Groundwater	9/25/2014	None	None	None	N/A	None	None	NB
EK093SC-A	Phase 2 Groundwater	11/7/2014	None	Saturated	Blebs	N/A	N/A	Blebs	3
EK094SC-A	Phase 2 Groundwater	9/22/2014	None	None	Saturated	N/A	N/A	Layer	NB
EK096SC-A	Phase 2 Groundwater	9/18/2014	None	None	None	N/A	Sheen	N/A	NB
EK097SC-A	Phase 2 Groundwater	9/16/2014	None	None	None	N/A	Sheen	N/A	NB
EK098SC-D	Phase 2 Groundwater	9/15/2014	None	None	None	N/A	N/A	N/A	N/A
EK099SC-A	Phase 2 Groundwater	11/14/2014	None	Sheen	None	N/A	Sheen	N/A	NB
EK100SC-A	Phase 2 Subsurface	7/10/2014	Blebs	Blebs	Saturated	N/A	Blebs	Layer	2
EK101SC-A	Phase 2 Subsurface	7/10/2014	Sheen	Sheen	Saturated	N/A	Sheen	Layer	NB
EK102SC-C	Phase 2 Subsurface	7/1/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
EK102SC-D	Phase 2 Subsurface	7/3/2014	None	Sheen	None	N/A	Sheen	N/A	NB
EK103SC-A	Phase 2 Subsurface	7/8/2014	Sheen	Sheen	Saturated	N/A	Sheen	Layer	NB
EK104SC-A	Phase 2 Subsurface	7/14/2014	None	Saturated	Saturated	N/A	Layer	Layer	3
MC005SC-E	Phase 2 Subsurface	6/19/2014	None	Blebs	NE	N/A	Blebs	NE	2
MC007SC-A	Phase 2 Subsurface	7/9/2014	Sheen	Blebs	NE	N/A	Blebs	NE	1
MC007SC-C	Phase 2 Subsurface	7/9/2014	None	Blebs	NE	N/A	Blebs	NE	2
MC029SC-A	Phase 2 Groundwater	8/26/2014	Sheen	Sheen	Sheen	N/A	Blebs	Sheen	2
MC030SC-A	Phase 2 Groundwater	8/28/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
MC031SC-A	Phase 2 Groundwater	8/27/2014	None	Sheen	None	N/A	Sheen	None	NB
NC003SC-F	Phase 2 Subsurface	7/22/2014	None	None	NE	N/A	None	NE	NB
NC012SC-C	Phase 2 Subsurface	7/21/2014	None	None	NE	None	None	NE	NB
NC012SC-F	Phase 2 Subsurface	7/21/2014	Sheen	Sheen	NE	N/A	Blebs	NE	2
NC022SC-B	Processed Phase 1 Archive	1/7/2015	None	Sheen	None	N/A	Blebs	None	3
NC023SC-B	Processed Phase 1 Archive	1/8/2015	None	Sheen	None	N/A	Blebs	None	2

Table C3-8

Summary of Most Notable Visual and Shake Test Observations in Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Most Notable Visual Observations			Most Notable Shake Test Observations			Maximum Shake Test Bleb Rank
			Surface Sediment	Subsurface Sediment	Native Material	Surface Sediment	Subsurface Sediment	Native Material	
NC029SC-A	Phase 2 Groundwater	9/10/2014	None	Sheen	None	N/A	Sheen	None	NB
NC036SC-A	Processed Phase 1 Archive	8/26/2015	None	Sheen	None	None	Sheen	None	NB
NC037SC-D	Phase 2 Subsurface	6/30/2014	None	Blebs	NE	N/A	Blebs	NE	2
NC044SC-B	Processed Phase 1 Archive	8/27/2015	None	Sheen	None	N/A	Blebs	None	1
NC045SC-A	Processed Phase 1 Archive	8/25/2015	None	None	None	N/A	Blebs	None	2
NC048SC-E	Processed Phase 1 Archive	8/25/2015	None	Blebs	None	None	Blebs	None	3
NC049SC-A	Processed Phase 1 Archive	8/25/2015	Sheen	Blebs	NE	None	Blebs	NE	1
NC050SC-B	Processed Phase 1 Archive	8/24/2015	None	Sheen	None	N/A	Sheen	None	NB
NC051SC-B	Processed Phase 1 Archive	8/25/2015	None	Blebs	None	N/A	Blebs	None	2
NC055SC-B	Processed Phase 1 Archive	8/27/2015	None	Sheen	None	N/A	Blebs	None	2
NC056SC-A	Phase 2 Groundwater	9/4/2014	None	None	Sheen	N/A	Sheen	Sheen	NB
NC062SC-A	Phase 2 Groundwater	11/20/2014	Sheen	Sheen	Sheen	N/A	Sheen	Sheen	NB
NC069SC-A	Phase 2 Groundwater	9/2/2014	None	Sheen	Saturated	N/A	Sheen	Blebs	4
NC069SC-B	Processed Phase 1 Archive	8/26/2015	None	Sheen	Coated	N/A	Blebs	Layer	1
NC071SC-B	Phase 2 Subsurface	7/2/2014	Sheen	Sheen	NE	N/A	Sheen	NE	NB
NC072SC-B	Processed Phase 1 Archive	11/19/2015	Sheen	Sheen	Coated	Sheen	Blebs	Layer	3
NC073SC-A	Processed Phase 1 Archive	11/18/2015	Sheen	Blebs	None	Sheen	Blebs	None	2
NC074SC-B	Processed Phase 1 Archive	11/18/2015	Sheen	None	None	Sheen	Sheen	Sheen	NB
NC075SC-A	Phase 2 Groundwater	8/20/2014	Blebs	Coated	Coated	N/A	Blebs	Layer	5
NC154SC-D	Phase 2 Subsurface	6/26/2014	None	None	NE	N/A	None	NE	NB
NC161SC-A	Phase 2 Subsurface	6/27/2014	None	None	NE	N/A	None	NE	NB
NC161SC-B	Phase 2 Subsurface	6/27/2014	None	None	NE	N/A	None	NE	NB
NC161SC-C	Phase 2 Subsurface	6/27/2014	None	None	NE	N/A	None	NE	NB
NC169SC-C	Phase 2 Subsurface	6/19/2014	None	Sheen	NE	N/A	None	NE	NB
NC169SC-D	Phase 2 Subsurface	6/19/2014	None	Sheen	NE	N/A	N/A	NE	N/A
NC174SC-D	Phase 2 Subsurface	7/2/2014	Sheen	Blebs	NE	N/A	Blebs	NE	2
NC176SC-A	Phase 2 Subsurface	7/30/2014	None	Blebs	Blebs	N/A	Blebs	Blebs	2
NC176SC-B	Phase 2 Subsurface	7/30/2014	None	Blebs	None	N/A	N/A	N/A	N/A
NC218SC-A	Phase 2 Groundwater	11/18/2014	None	None	None	N/A	None	None	NB
NC229SC-A	Phase 2 Subsurface	6/25/2014	None	Blebs	None	N/A	Blebs	N/A	2
NC229SC-B	Phase 2 Subsurface	6/25/2014	None	Sheen	None	N/A	Sheen	N/A	NB
NC230SC-A	Phase 2 Subsurface	6/25/2014	None	Blebs	None	N/A	Blebs	N/A	2
NC230SC-B	Phase 2 Subsurface	6/25/2014	None	Sheen	None	N/A	Sheen	Sheen	NB
NC233SC-A	Phase 2 Subsurface	6/16/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
NC233SC-B	Phase 2 Subsurface	6/13/2014	None	Sheen	Sheen	N/A	N/A	N/A	N/A
NC251SC-A	Phase 2 Subsurface	7/11/2014	None	Blebs	None	N/A	Blebs	N/A	2
NC253SC-A	Phase 2 Subsurface	7/23/2014	None	None	NE	N/A	None	NE	NB
NC254SC-G	Phase 2 Subsurface	7/28/2014	None	Blebs	NE	N/A	Blebs	NE	3
NC255SC-A	Phase 2 Subsurface	7/28/2014	None	None	NE	None	None	NE	NB
NC256SC-A	Phase 2 Subsurface	7/25/2014	None	Sheen	NE	N/A	Sheen	NE	NB
NC256SC-B	Phase 2 Subsurface	7/25/2014	None	Sheen	NE	None	Sheen	NE	NB

Table C3-8

Summary of Most Notable Visual and Shake Test Observations in Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Most Notable Visual Observations			Most Notable Shake Test Observations			Maximum Shake Test Bleb Rank
			Surface Sediment	Subsurface Sediment	Native Material	Surface Sediment	Subsurface Sediment	Native Material	
NC256SC-G	Phase 2 Subsurface	7/25/2014	None	Sheen	NE	N/A	N/A	NE	N/A
NC257SC-F	Phase 2 Subsurface	7/28/2014	None	None	NE	N/A	None	NE	NB
NC258SC-A	Phase 2 Subsurface	7/24/2014	None	Blebs	None	N/A	Blebs	None	2
NC258SC-D	Phase 2 Subsurface	7/8/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
NC258SC-E	Phase 2 Subsurface	7/16/2014	None	Sheen	None	N/A	Sheen	N/A	NB
NC258SC-F	Phase 2 Subsurface	7/14/2014	None	Blebs	NE	N/A	Blebs	NE	2
NC259SC-A	Phase 2 Subsurface	6/30/2014	None	Blebs	NE	N/A	Blebs	NE	2
NC260SC-E	Phase 2 Subsurface	7/25/2014	None	Sheen	NE	N/A	Sheen	NE	NB
NC261SC-A	Phase 2 Subsurface	7/31/2014	None	Blebs	None	N/A	Blebs	None	2
NC262SC-A	Phase 2 Subsurface	7/29/2014	None	Blebs	None	N/A	Layer	None	NB
NC263SC-C	Phase 2 Subsurface	7/30/2014	None	Blebs	Sheen	N/A	Blebs	Sheen	2
NC264SC-B	Phase 2 Subsurface	7/31/2014	None	Blebs	Blebs	N/A	Blebs	Blebs	2
NC265SC-A	Phase 2 Subsurface	7/16/2014	None	Coated	None	N/A	Blebs	None	5
NC265SC-B	Phase 2 Subsurface	7/17/2014	Sheen	Coated	None	N/A	Blebs	N/A	5
NC266SC-A	Phase 2 Groundwater	11/8/2014	Sheen	None	None	None	None	None	NB
NC267SC-A	Phase 2 Groundwater	9/12/2014	None	Sheen	None	N/A	Blebs	N/A	1
NC268SC-A	Phase 2 Groundwater	9/29/2014	None	Sheen	None	N/A	Sheen	None	NB
NC269SC-A	Phase 2 Groundwater	9/5/2014	None	None	None	N/A	None	None	NB
NC270SC-D	Phase 2 Groundwater	9/11/2014	Sheen	None	None	Sheen	None	N/A	NB
NC271SC-A	Phase 2 Groundwater	12/3/2014	None	Saturated	None	N/A	Blebs	None	2
NC271SC-B	Phase 2 Groundwater	1/7/2015	Sheen	Sheen	NE	N/A	None	NE	NB
NC271SC-C	Phase 2 Groundwater	1/7/2015	Sheen	Sheen	NE	N/A	Blebs	NE	3
NC272SC-A	Phase 2 Groundwater	12/4/2014	None	None	None	N/A	N/A	None	NB
NC273SC-A	Phase 2 Groundwater	8/4/2014	NE	Sheen	None	NE	Sheen	None	NB
NC275SC-A	Phase 2 Groundwater	9/27/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
NC276SC-A	Phase 2 Groundwater	12/5/2014	None	Sheen	None	N/A	Blebs	None	3
NC277SC-A	Phase 2 Groundwater	12/2/2014	Sheen	Blebs	Sheen	N/A	Blebs	None	2
NC278SC-A	Phase 2 Groundwater	12/1/2014	None	Sheen	None	N/A	Blebs	None	2
NC279SC-A	Phase 2 Groundwater	8/5/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
NC280SC-A	Phase 2 Groundwater	8/8/2014	None	None	None	N/A	N/A	Sheen	NB
NC281SC-A	Phase 2 Groundwater	8/7/2014	NE	Sheen	Sheen	NE	Sheen	Sheen	NB
NC282SC-A	Phase 2 Groundwater	10/2/2014	NE	Sheen	None	NE	Blebs	None	2
NC284SC-A	Phase 2 Groundwater	8/12/2014	Sheen	Sheen	None	N/A	Blebs	None	2
NC286SC-A	Phase 2 Groundwater	11/17/2014	None	None	None	N/A	Sheen	None	NB
NC287SC-A	Phase 2 Groundwater	8/13/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
NC288SC-A	Phase 2 Groundwater	11/15/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
NC295SC-A	Phase 2 Subsurface	9/30/2014	None	None	Sheen	N/A	None	Sheen	NB
NC296SC-A	Phase 2 Groundwater	8/19/2014	Sheen	Coated	Coated	N/A	Layer	Blebs	5
NC298SC-A	Phase 2 Groundwater	8/21/2014	Coated	Coated	Coated	N/A	Layer	Blebs	4
NC299SC-A	Phase 2 Groundwater	8/18/2014	NE	Sheen	None	NE	Sheen	None	NB
NC300SC-A	Phase 2 Groundwater	8/15/2014	Sheen	Sheen	None	N/A	Sheen	None	NB

Table C3-8
Summary of Most Notable Visual and Shake Test Observations in Cores Processed Using Phase 2 Methods

Core ID	Core Type	Core Process Date	Most Notable Visual Observations			Most Notable Shake Test Observations			Maximum Shake Test Bleb Rank
			Surface Sediment	Subsurface Sediment	Native Material	Surface Sediment	Subsurface Sediment	Native Material	
NC306SC-C	Phase 2 Subsurface	6/24/2014	None	Blebs	NE	N/A	Blebs	NE	2
NC307SC-B	Phase 2 Subsurface	6/24/2014	None	Sheen	None	N/A	Sheen	N/A	NB
NC308SC-A	Phase 2 Subsurface	6/16/2014	Sheen	Sheen	NE	N/A	Sheen	NE	NB
NC308SC-B	Phase 2 Subsurface	6/16/2014	Sheen	Sheen	NE	N/A	Sheen	NE	NB
NC309SC-A	Phase 2 Subsurface	6/13/2014	Sheen	Sheen	NE	N/A	N/A	NE	N/A
NC309SC-B	Phase 2 Subsurface	6/13/2014	Sheen	Sheen	NE	N/A	N/A	NE	N/A
NC309SC-C	Phase 2 Subsurface	6/13/2014	Sheen	Blebs	NE	N/A	Blebs	NE	3
NC319SC-A	Phase 2 Groundwater	8/14/2014	None	Sheen	None	N/A	Sheen	None	NB
NC320SC-A	Phase 2 Groundwater	11/24/2014	Sheen	Sheen	None	N/A	Sheen	N/A	NB
WC003SC-F	Phase 2 Subsurface	7/22/2014	None	Sheen	NE	None	Sheen	NE	NB
WC003SC-G	Phase 2 Subsurface	7/22/2014	None	Sheen	NE	N/A	N/A	NE	N/A
WC003SC-H	Phase 2 Subsurface	7/22/2014	None	Sheen	NE	N/A	N/A	NE	N/A
WC008SC-A	Phase 2 Groundwater	11/3/2014	Sheen	Sheen	None	N/A	Sheen	None	NB
WC012SC-B	Phase 2 Subsurface	6/26/2014	Sheen	Sheen	NE	N/A	Sheen	NE	NB
WC015SC-E	Phase 2 Subsurface	7/25/2014	None	Sheen	NE	N/A	Sheen	NE	NB
WC015SC-F	Phase 2 Subsurface	7/25/2014	None	Sheen	NE	N/A	N/A	NE	N/A
WC015SC-G	Phase 2 Subsurface	7/25/2014	None	Sheen	NE	N/A	N/A	NE	N/A
WC017SC-A	Phase 2 Groundwater	9/9/2014	None	Sheen	Sheen	N/A	Sheen	None	NB
WC018SC-A	Phase 2 Groundwater	9/8/2014	None	None	None	N/A	Sheen	None	NB

Notes:
Native Material = Material deposited prior to the physical influence of humans on the natural environment and consists of the deposits below the sediment.
None = No sheen or NAPL observed.
Shake Test Observations = Using Phase 2 SOP NC-21 – Sediment-Water Shake Test (Anchor QEA 2014), jar contents are observed for the presence of a sheen, NAPL blebs, or a NAPL layer.
Subsurface = Deposits below surface sediment and above the native material and represents the portion of the sediment column deposited in recent time.
Surface = Deposits within the top 6 inches below the sediment surface (i.e., mudline); it is the most recently deposited material.
Visual Observations = Observations described as none, sheen, blebs, coated, or saturated are based on Phase 2 field methods (Anchor QEA 2014).

Acronyms:
N/A = not applicable, shake test or visual observation not conducted
NB = no blebs observed in shake test
NE = native material not encountered
SOP = Standard Operating Procedure

Reference:
Anchor QEA (Anchor QEA, LLC), 2014. Phase 2 Field Sampling and Analysis Plan – Volume 2. Newtown Creek Remedial Investigation/Feasibility Study. November 2014.

Table C3-9
Summary of Most Notable Visual Observations in National Grid Cores

Core ID	Core Type	Core Process Date	Most Notable Visual Observations		
			Surface Sediment	Subsurface Sediment	Native Material
GPEC-GT12	National Grid	9/1/2009	Blebs	Coated	Coated
GPEC-GT14	National Grid	9/1/2009	None	Coated	None
GPEC-GT16	National Grid	8/25/2009	N/A	None	None
GPEC-GT18	National Grid	9/3/2009	Sheen	Blebs	None
GPEC-GT20	National Grid	9/9/2009	Sheen	Coated	None
GPEC-GT22	National Grid	9/15/2009	Sheen	Sheen	Blebs
GPEC-SB110	National Grid	6/28/2010	N/A	None	Coated
GPEC-SB111	National Grid	7/2/2010	N/A	Saturated	Saturated
GPEC-SB112	National Grid	7/6/2010	N/A	Saturated	Saturated
GPEC-SB113	National Grid	7/19/2010	N/A	None	Sheen
GPEC-SB114	National Grid	7/22/2010	None	Coated	None
GPEC-SED01	National Grid	6/23/2010	Blebs	Blebs	None
GPEC-SED02	National Grid	6/23/2010	Sheen	Saturated	None
GPEC-SED03	National Grid	6/21/2010	Sheen	None	None
GPEC-SED04	National Grid	6/23/2010	Sheen	None	Sheen
GPEC-SED05	National Grid	6/23/2010	Sheen	Coated	Saturated
GPEC-SED06	National Grid	6/21/2010	Sheen	Coated	Coated
GPEC-SED07	National Grid	6/23/2010	Sheen	Coated	None
GPEC-SED08	National Grid	6/23/2010	Sheen	Sheen	Blebs
GPEC-SED09	National Grid	6/21/2010	None	None	Saturated
GPEC-SED10	National Grid	6/24/2010	Sheen	Saturated	None
GPEC-SED11	National Grid	6/24/2010	Sheen	Coated	None
GPEC-SED12	National Grid	6/22/2010	Sheen	Coated	Coated
GPEC-SED13	National Grid	6/22/2010	Sheen	Coated	Coated
GPEC-SED14	National Grid	6/22/2010	Blebs	Coated	Coated
GPEC-SED15	National Grid	6/22/2010	Sheen	Blebs	Coated
GPEC-SED16	National Grid	6/22/2010	None	None	None
GPEC-SED17	National Grid	6/22/2010	Blebs	Saturated	Saturated

Table C3-9
Summary of Most Notable Visual Observations in National Grid Cores

Core ID	Core Type	Core Process Date	Most Notable Visual Observations		
			Surface Sediment	Subsurface Sediment	Native Material
GPEC-SED18	National Grid	6/22/2010	Sheen	Coated	Coated
GPEC-SED19	National Grid	6/24/2010	Sheen	Sheen	None
GPEC-SED20	National Grid	6/24/2010	Sheen	Blebs	Saturated
GPEC-SED21	National Grid	6/25/2010	Sheen	None	None
GPEC-SED22	National Grid	6/24/2010	Sheen	Sheen	None
GPEC-SED23	National Grid	6/25/2010	Blebs	Blebs	None
GPEC-SED24	National Grid	6/25/2010	Sheen	Sheen	None
GPEC-SED25	National Grid	6/25/2010	Sheen	Sheen	None
GPEC-SED26	National Grid	6/25/2010	Blebs	Blebs	None
GPEC-SED27	National Grid	6/25/2010	Sheen	Coated	None
GPEC-SED28	National Grid	6/25/2010	Sheen	None	NE
GPEC-SED29	National Grid	6/25/2010	Sheen	Coated	None
GPEC-SED30	National Grid	6/25/2010	Sheen	Sheen	None
GPEC-SED31	National Grid	6/25/2010	Sheen	Sheen	None

Notes:
Native Material = Material deposited prior to the physical influence of humans on the natural environment and consists of the deposits below the sediment.
None = No sheen or NAPL observed.
Subsurface = Deposits below surface sediment and above the native material and represents the portion of the sediment column deposited in recent time.
Surface = Deposits within the top 15 centimeters below the sediment surface (i.e., mudline); it is the most recently deposited material.
Visual Observations = Observations described as none, blebs, coated, or saturated are based on National Grid field methods (GEI 2009).

Acronyms:
N/A = not applicable; visual observation not conducted
NE = native material not encountered

Reference:
GEI (GEI Consultants, Inc.), 2009. *Field Sampling Plan, Greenpoint Energy Center.* Prepared for National Grid. January 2009.

Table C3-10
Summary of Dual Observation Cores Grouped by Category

Shake Test Result	Phase 2 Visual Observations					Phase 1 Visual Observations		
	None	Sheen	Blebs	Coated	Saturated	Oil-stained	Oil-coated	Oil-wetted
Negative	25[1]	3	0	0	0	0	0	0
Sheen	9	63	0	0	0	0	0	1
Blebs	2	15	27	2	3	0	0	0
Layer	0	0	1	8	7	0	2	2
Total Cores by Program	165					5		

Notes:
1 = Includes four groundwater program cores with no visual evidence and where shake tests were not conducted; referred to as Phase 2 deviation cores.

Counts of Category 1A cores with no NAPL are shaded in gray (101 cores[1]).
Counts of Category 1B cores with residual NAPL are shaded in blue (49 cores).
Counts of Category 2 cores with more notable NAPL impacts are shaded in orange (1 core).
Counts of Category 3 cores with more notable NAPL impacts are shaded in purple (19 cores).

Acronym:
NAPL = nonaqueous phase liquid

Table C3-11
Cores by Evaluation Area

Core ID	Core Type	Core Process Date	NAPL Category	Newtown Creek NAPL Evaluation Area ID
DK012SC-A	Phase 2	8/1/2014	1A	Category 1B Area B
DK033SC-A	Phase 2	7/7/2014	1A	Dutch Kills
DK033SC-D	Phase 2	6/18/2014	N/A[1]	Dutch Kills
DK033SC-G	Phase 2	6/18/2014	1A	Dutch Kills
DK037SC-A	Phase 2	6/17/2014	1A	Dutch Kills
DK037SC-B	Phase 2	6/17/2014	N/A[1]	Dutch Kills
DK037SC-E	Phase 2	6/17/2014	N/A[1]	Dutch Kills
DK041SC-A	Phase 2	7/31/2014	1A	Category 1B Area B
DK042SC-A	Phase 2	10/9/2014	1A	Dutch Kills
DK043SC-A	Phase 2	10/9/2014	1A	Dutch Kills
DK044SC-A	Phase 2	10/17/2014	1A	Dutch Kills
DK045SC-A	Phase 2	10/16/2014	1A	Dutch Kills
DK052SC-A	Phase 2	10/15/2014	1A[2]	Dutch Kills
EB006SC-A	Phase 2	7/18/2014	1B	Category 1B Area G
EB025SC-A	Phase 2	10/29/2014	1A	Category 1B Area G
EB040SC-A	Phase 2	7/17/2014	1B	Category 1B Area G
EB040SC-D	Phase 2	7/21/2014	1B	Category 1B Area G
EB040SC-E	Phase 2	7/22/2014	1B	Category 1B Area G
EB041SC-A	Phase 2	6/12/2014	1A	Category 1B Area G
EB041SC-B	Phase 2	6/12/2014	1A	Category 1B Area G
EB045SC-A	Phase 2	7/24/2014	1B	Category 1B Area G
EB045SC-B	Phase 2	7/23/2014	1A	Category 1B Area G
EB046SC-A	Phase 2	11/10/2014	1A	Category 1B Area G
EB047SC-A	Phase 2	11/6/2014	1A	Category 1B Area G
EB048SC-A	Phase 2	10/31/2014	1A	Category 1B Area G
EB049SC-A	Phase 2	10/28/2014	1A[2]	Category 1B Area G
EB050SC-A	Phase 2	10/27/2014	1A	Category 1B Area G
EB051SC-A	Phase 2	11/1/2014	1A	Category 1B Area G
EB052SC-A	Phase 2	10/30/2014	1A	Category 1B Area G
EK003SC-B	Processed Phase 1 Archive	7/1/2014	3	Lower English Kills Category 2/3 Area
EK004ASC	Phase 1 Shake Tested	6/27/2012	3	Lower English Kills Category 2/3 Area
EK004SC-B	Processed Phase 1 Archive	6/30/2014	3	Lower English Kills Category 2/3 Area
EK005BSC	Phase 1 Shake Tested	7/9/2012	3	Lower English Kills Category 2/3 Area
EK005SC-A	Processed Phase 1 Archive	7/4/2014	3	Lower English Kills Category 2/3 Area
EK006SC-C	Phase 2	7/3/2014	1A	Lower English Kills Category 2/3 Area
EK006SC-D	Phase 2	7/3/2014	3	Lower English Kills Category 2/3 Area
EK007ASC	Phase 1 USEPA-Identified	6/27/2012	N/A[3]	Category 1B Area H
EK007SC-B	Processed Phase 1 Archive	11/19/2015	1A	Category 1B Area H
EK008SC-B	Processed Phase 1 Archive	11/19/2015	1A	Category 1B Area H
EK009ASC	Phase 1 USEPA-Identified	6/26/2012	N/A[3]	Category 1B Area H
EK009CSC	Phase 1 USEPA-Identified	6/26/2012	N/A[3]	Category 1B Area H
EK009SC-A	Phase 2	9/19/2014	1A	Category 1B Area H
EK013SC-A	Phase 2	9/18/2014	1A[2]	Category 1B Area H
EK018ASC	Phase 1 USEPA-Identified	6/28/2012	N/A[3]	Category 1B Area H
EK026SC-A	Phase 2	11/13/2014	1A	Category 1B Area H
EK036SC-A	Phase 2	9/23/2014	1A	Lower English Kills Category 2/3 Area
EK042SC-A	Phase 2	11/11/2014	1A	Category 1B Area H
EK070SC-A	Phase 2	9/17/2014	1A	Category 1B Area H
EK078SC-C	Phase 2	6/23/2014	1B	Category 1B Area G
EK079SC-A	Phase 2	6/23/2014	1A	Lower English Kills Category 2/3 Area
EK080SC-A	Phase 2	6/10/2014	3	Lower English Kills Category 2/3 Area
EK081SC-A	Phase 2	6/13/2014	1A	Lower English Kills Category 2/3 Area
EK081SC-B	Phase 2	6/13/2014	N/A[1]	Lower English Kills Category 2/3 Area
EK082SC-A	Phase 2	6/11/2014	1A	Category 1B Area H
EK082SC-B	Phase 2	6/11/2014	N/A[1]	Category 1B Area H
EK083SC-B	Phase 2	6/12/2014	N/A[1]	Category 1B Area H
EK083SC-C	Phase 2	6/12/2014	1B	Category 1B Area H
EK084SC-C	Phase 2	6/20/2014	1A	Category 1B Area H
EK085SC-D	Phase 2	7/10/2014	1B	Category 1B Area H
EK089SC-A	Phase 2	7/29/2014	1A	Lower English Kills Category 2/3 Area
EK090SC-A	Phase 2	8/22/2014	1A	Category 1B Area G
EK091SC-A	Phase 2	10/1/2014	1A	Lower English Kills Category 2/3 Area
EK092SC-A	Phase 2	9/25/2014	1A	Lower English Kills Category 2/3 Area
EK093SC-A	Phase 2	11/7/2014	1B	Lower English Kills Category 2/3 Area
EK094SC-A	Phase 2	9/22/2014	3	Lower English Kills Category 2/3 Area
EK096SC-A	Phase 2	9/18/2014	1A	Category 1B Area H
EK097SC-A	Phase 2	9/16/2014	1A	Category 1B Area H
EK098SC-D	Phase 2	9/15/2014	1A[2]	Category 1B Area H
EK099SC-A	Phase 2	11/14/2014	1A	Category 1B Area H

Table C3-11
Cores by Evaluation Area

Core ID	Core Type	Core Process Date	NAPL Category	Newtown Creek NAPL Evaluation Area ID
EK100SC-A	Phase 2	7/10/2014	3	Lower English Kills Category 2/3 Area
EK101SC-A	Phase 2	7/10/2014	3	Lower English Kills Category 2/3 Area
EK102SC-C	Phase 2	7/1/2014	1A	Category 1B Area H
EK102SC-D	Phase 2	7/3/2014	1A	Category 1B Area H
EK103SC-A	Phase 2	7/8/2014	3	Lower English Kills Category 2/3 Area
EK104SC-A	Phase 2	7/14/2014	3	Lower English Kills Category 2/3 Area
GPEC-GT12	National Grid	9/1/2009	N/A[3]	Turning Basin Category 2/3 Area
GPEC-GT14	National Grid	9/1/2009	N/A[3]	Turning Basin Category 2/3 Area
GPEC-GT16	National Grid	8/25/2009	N/A[3]	Turning Basin Category 2/3 Area
GPEC-GT18	National Grid	9/3/2009	N/A[3]	Turning Basin Category 2/3 Area
GPEC-GT20	National Grid	9/9/2009	N/A[3]	Category 1B Area E/Turning Basin Category 2/3 Area
GPEC-GT22	National Grid	9/15/2009	N/A[3]	Category 1B Area D
GPEC-SB110	National Grid	6/28/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SB111	National Grid	7/2/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SB112	National Grid	7/6/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SB113	National Grid	7/19/2010	N/A[3]	Category 1B Area E/Turning Basin Category 2/3 Area
GPEC-SB114	National Grid	7/22/2010	N/A[3]	Category 1B Area E/Turning Basin Category 2/3 Area
GPEC-SED01	National Grid	6/23/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED02	National Grid	6/23/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED03	National Grid	6/21/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED04	National Grid	6/23/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED05	National Grid	6/23/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED06	National Grid	6/21/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED07	National Grid	6/23/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED08	National Grid	6/23/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED09	National Grid	6/21/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED10	National Grid	6/24/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED11	National Grid	6/24/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED12	National Grid	6/22/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED13	National Grid	6/22/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED14	National Grid	6/22/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED15	National Grid	6/22/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED16	National Grid	6/22/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED17	National Grid	6/22/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED18	National Grid	6/22/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED19	National Grid	6/24/2010	N/A[3]	Category 1B Area E/Turning Basin Category 2/3 Area
GPEC-SED20	National Grid	6/24/2010	N/A[3]	Category 1B Area E/Turning Basin Category 2/3 Area
GPEC-SED21	National Grid	6/25/2010	N/A[3]	Category 1B Area D
GPEC-SED22	National Grid	6/24/2010	N/A[3]	Category 1B Area D
GPEC-SED23	National Grid	6/25/2010	N/A[3]	Category 1B Area E
GPEC-SED24	National Grid	6/25/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED25	National Grid	6/25/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED26	National Grid	6/25/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED27	National Grid	6/25/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED28	National Grid	6/25/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED29	National Grid	6/25/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED30	National Grid	6/25/2010	N/A[3]	Turning Basin Category 2/3 Area
GPEC-SED31	National Grid	6/25/2010	N/A[3]	Category 1B Area E/Turning Basin Category 2/3 Area
MC005SC-E	Phase 2	6/19/2014	1B	Category 1B Area F
MC007SC-A	Phase 2	7/9/2014	1B	Category 1B Area F
MC007SC-C	Phase 2	7/9/2014	1B	Category 1B Area F
MC029SC-A	Phase 2	8/26/2014	1B	Category 1B Area F
MC030SC-A	Phase 2	8/28/2014	1A	Category 1B Area F
MC031SC-A	Phase 2	8/27/2014	1A	Category 1B Area F
NC003SC-F	Phase 2	7/22/2014	1A	Category 1B Area A
NC012SC-C	Phase 2	7/21/2014	1A	Category 1B Area B
NC012SC-F	Phase 2	7/21/2014	1B	Category 1B Area B
NC016BSC	Phase 1 USEPA-Identified	5/31/2012	N/A[3]	Category 1B Area B
NC022CSC	Phase 1 USEPA-Identified	5/19/2012	N/A[3]	Category 1B Area B
NC022SC-B	Processed Phase 1 Archive	1/7/2015	1B	Category 1B Area B
NC023ASC	Phase 1 USEPA-Identified	5/16/2012	N/A[3]	Category 1B Area B
NC023SC-B	Processed Phase 1 Archive	1/8/2015	1B	Category 1B Area B
NC029SC-A	Phase 2	9/10/2014	1A	Category 1B Area C
NC030BSC	Phase 1 USEPA-Identified	5/30/2012	N/A[3]	Category 1B Area C
NC032ASC	Phase 1 USEPA-Identified	5/22/2012	N/A[3]	Category 1B Area C
NC036BSC	Phase 1 USEPA-Identified	5/23/2012	N/A[3]	Category 1B Area C
NC036CSC	Phase 1 USEPA-Identified	5/23/2012	N/A[3]	Category 1B Area C

Table C3-11
Cores by Evaluation Area

Core ID	Core Type	Core Process Date	NAPL Category	Newtown Creek NAPL Evaluation Area ID
NC036SC-A	Processed Phase 1 Archive	8/26/2015	1A	Category 1B Area C
NC037ASC	Phase 1 USEPA-Identified	5/21/2012	N/A[3]	Category 1B Area C
NC037SC-D	Phase 2	6/30/2014	1B	Category 1B Area C
NC044ASC	Phase 1 USEPA-Identified	6/1/2012	N/A[3]	Category 1B Area C
NC044SC-B	Processed Phase 1 Archive	8/27/2015	1B	Category 1B Area C
NC045BSC	Phase 1 USEPA-Identified	7/11/2012	N/A[3]	Category 1B Area C
NC045SC-A	Processed Phase 1 Archive	8/25/2015	1B	Category 1B Area C
NC048CSC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	6/4/2012	3	CM 1.7 Category 2/3 Area
NC048SC-E	Processed Phase 1 Archive	8/25/2015	1B	CM 1.7 Category 2/3 Area
NC049SC-A	Processed Phase 1 Archive	8/25/2015	1B	CM 1.7 Category 2/3 Area
NC050ASC	Phase 1 USEPA-Identified/Phase 1 Shake Tested	6/4/2012	3	CM 1.7 Category 2/3 Area
NC050SC-B	Processed Phase 1 Archive	8/24/2015	1A	CM 1.7 Category 2/3 Area
NC051ASC	Phase 1 USEPA-Identified	7/4/2012	N/A[3]	Category 1B Area CM 2.2/CM 1.7 Category 2/3 Area
NC051SC-B	Processed Phase 1 Archive	8/25/2015	1B	Category 1B Area CM 2.2/CM 1.7 Category 2/3 Area
NC055ASC	Phase 1 USEPA-Identified	7/10/2012	N/A[3]	Category 1B Area CM 2.2/CM 1.7 Category 2/3 Area
NC055SC-B	Processed Phase 1 Archive	8/27/2015	1B	Category 1B Area CM 2.2/CM 1.7 Category 2/3 Area
NC056SC-A	Phase 2	9/4/2014	1A	Category 1B Area CM 2.2/CM 1.7 Category 2/3 Area
NC062SC-A	Phase 2	11/20/2014	1A	Category 1B Area CM 2.2
NC069ASC	Phase 1 USEPA-Identified	6/14/2012	N/A[3]	Category 1B Area E/Turning Basin Category 2/3 Area
NC069SC-A	Phase 2	9/2/2014	1B	Category 1B Area E/Turning Basin Category 2/3 Area
NC069SC-B	Processed Phase 1 Archive	8/26/2015	3	Category 1B Area E/Turning Basin Category 2/3 Area
NC071CSC	Phase 1 Shake Tested	7/3/2012	1A	Category 1B Area E
NC071SC-B	Phase 2	7/2/2014	1A	Category 1B Area E
NC072SC-B	Processed Phase 1 Archive	11/19/2015	3	Turning Basin Category 2/3 Area
NC073BSC	Phase 1 USEPA-Identified	6/13/2012	N/A[3]	Turning Basin Category 2/3 Area
NC073SC-A	Processed Phase 1 Archive	11/18/2015	1B	Turning Basin Category 2/3 Area
NC074SC-B	Processed Phase 1 Archive	11/18/2015	1A	Turning Basin Category 2/3 Area
NC075SC-A	Phase 2	8/20/2014	3	Turning Basin Category 2/3 Area
NC154SC-D	Phase 2	6/26/2014	1A	Category 1B Area A
NC161SC-A	Phase 2	6/27/2014	1A	Category 1B Area B
NC161SC-B	Phase 2	6/27/2014	1A	Category 1B Area B
NC161SC-C	Phase 2	6/27/2014	1A	Category 1B Area B
NC169SC-C	Phase 2	6/19/2014	1A	Category 1B Area CM 2.2
NC169SC-D	Phase 2	6/19/2014	N/A[1]	Category 1B Area CM 2.2
NC174SC-D	Phase 2	7/2/2014	1B	Category 1B Area D
NC176SC-A	Phase 2	7/30/2014	1B	Category 1B Area E
NC176SC-B	Phase 2	7/30/2014	N/A[1]	Category 1B Area E
NC218SC-A	Phase 2	11/18/2014	1A	Turning Basin Category 2/3 Area
NC229SC-A	Phase 2	6/25/2014	1B	Category 1B Area D
NC229SC-B	Phase 2	6/25/2014	1A	Category 1B Area D
NC230SC-A	Phase 2	6/25/2014	1B	Category 1B Area D
NC230SC-B	Phase 2	6/25/2014	1A	Category 1B Area D
NC233SC-A	Phase 2	6/16/2014	1A	Turning Basin Category 2/3 Area
NC233SC-B	Phase 2	6/13/2014	N/A[1]	Turning Basin Category 2/3 Area
NC251SC-A	Phase 2	7/11/2014	1B	Category 1B Area A
NC253SC-A	Phase 2	7/23/2014	1A	Category 1B Area A
NC254SC-G	Phase 2	7/28/2014	1B	Category 1B Area A
NC255SC-A	Phase 2	7/28/2014	1A	Category 1B Area A
NC256SC-A	Phase 2	7/25/2014	1A	Category 1B Area B
NC256SC-B	Phase 2	7/25/2014	1A	Category 1B Area B
NC256SC-G	Phase 2	7/25/2014	N/A[1]	Category 1B Area B
NC257SC-F	Phase 2	7/28/2014	1A	Category 1B Area B
NC258SC-A	Phase 2	7/24/2014	1B	Category 1B Area B
NC258SC-D	Phase 2	7/8/2014	1A	Category 1B Area B
NC258SC-E	Phase 2	7/16/2014	1A	Category 1B Area B
NC258SC-F	Phase 2	7/14/2014	1B	Category 1B Area B
NC259SC-A	Phase 2	6/30/2014	1B	Category 1B Area B
NC260SC-E	Phase 2	7/25/2014	1A	Category 1B Area B
NC261SC-A	Phase 2	7/31/2014	1B	Category 1B Area C
NC262SC-A	Phase 2	7/29/2014	2	CM 1.7 Category 2/3 Area
NC263SC-C	Phase 2	7/30/2014	1B	Category 1B Area CM 2.2
NC264SC-B	Phase 2	7/31/2014	1B	Category 1B Area D
NC265SC-A	Phase 2	7/16/2014	1B	Turning Basin Category 2/3 Area
NC265SC-B	Phase 2	7/17/2014	1B	Turning Basin Category 2/3 Area
NC266SC-A	Phase 2	11/8/2014	1A	Category 1B Area A
NC267SC-A	Phase 2	9/12/2014	1B	Category 1B Area A
NC268SC-A	Phase 2	9/29/2014	1A	Category 1B Area A
NC269SC-A	Phase 2	9/5/2014	1A	Category 1B Area B
NC270SC-D	Phase 2	9/11/2014	1A	Category 1B Area B
NC271SC-A	Phase 2	12/3/2014	1B	Category 1B Area B
NC271SC-B	Phase 2	1/7/2015	1A	Category 1B Area B

Table C3-11
Cores by Evaluation Area

Core ID	Core Type	Core Process Date	NAPL Category	Newtown Creek NAPL Evaluation Area ID
NC271SC-C	Phase 2	1/7/2015	1B	Category 1B Area B
NC272SC-A	Phase 2	12/4/2014	1A	Category 1B Area B
NC273SC-A	Phase 2	8/4/2014	1A	Category 1B Area C
NC275SC-A	Phase 2	9/27/2014	1A	Category 1B Area C
NC276SC-A	Phase 2	12/5/2014	1B	Category 1B Area C
NC277SC-A	Phase 2	12/2/2014	1B	Category 1B Area C
NC278SC-A	Phase 2	12/1/2014	1B	Category 1B Area C
NC279SC-A	Phase 2	8/5/2014	1A	Category 1B Area C
NC280SC-A	Phase 2	8/8/2014	1A	Category 1B Area C
NC281SC-A	Phase 2	8/7/2014	1A	CM 1.7 Category 2/3 Area
NC282SC-A	Phase 2	10/2/2014	1B	Category 1B Area CM 2.2/CM 1.7 Category 2/3 Area
NC284SC-A	Phase 2	8/12/2014	1B	Category 1B Area CM 2.2
NC286SC-A	Phase 2	11/17/2014	1A	Category 1B Area D
NC287SC-A	Phase 2	8/13/2014	1A	Category 1B Area E
NC288SC-A	Phase 2	11/15/2014	1A	Category 1B Area E
NC295SC-A	Phase 2	9/30/2014	1A	Category 1B Area A
NC296SC-A	Phase 2	8/19/2014	3	Turning Basin Category 2/3 Area
NC298SC-A	Phase 2	8/21/2014	3	Turning Basin Category 2/3 Area
NC299SC-A	Phase 2	8/18/2014	1A	Category 1B Area G
NC300SC-A	Phase 2	8/15/2014	1A	Category 1B Area G
NC306SC-C	Phase 2	6/24/2014	1B	Category 1B Area D
NC307SC-B	Phase 2	6/24/2014	1A	Category 1B Area E
NC308SC-A	Phase 2	6/16/2014	1A	Category 1B Area E
NC308SC-B	Phase 2	6/16/2014	1A	Category 1B Area E
NC309SC-A	Phase 2	6/13/2014	N/A[1]	Turning Basin Category 2/3 Area
NC309SC-B	Phase 2	6/13/2014	N/A[1]	Turning Basin Category 2/3 Area
NC309SC-C	Phase 2	6/13/2014	1B	Turning Basin Category 2/3 Area
NC319SC-A	Phase 2	8/14/2014	1A	Category 1B Area E
NC320SC-A	Phase 2	11/24/2014	1A	Category 1B Area B
WC003SC-F	Phase 2	7/22/2014	1A	Whale Creek
WC003SC-G	Phase 2	7/22/2014	N/A[1]	Whale Creek
WC003SC-H	Phase 2	7/22/2014	N/A[1]	Whale Creek
WC008SC-A	Phase 2	11/3/2014	1A	Whale Creek
WC012SC-B	Phase 2	6/26/2014	1A	Whale Creek
WC015SC-E	Phase 2	7/25/2014	1A	Whale Creek
WC015SC-F	Phase 2	7/25/2014	N/A[1]	Whale Creek
WC015SC-G	Phase 2	7/25/2014	N/A[1]	Whale Creek
WC017SC-A	Phase 2	9/9/2014	1A	Whale Creek
WC018SC-A	Phase 2	9/8/2014	1A	Whale Creek

Notes:
1 = Secondary core collocated with a primary core, collected to provide additional sediment volume for laboratory analysis. Visual observations of potential NAPL were similar to the primary core. Therefore, a shake test was not conducted.
2 = Four groundwater program cores with no visual evidence and where shake tests were not conducted; referred to as Phase 2 deviation cores, categorized as Category 1A.
3 = Shake tests were not conducted for Phase 1 USEPA-identified cores and National Grid cores.

Acronyms:
CM = creek mile
N/A = not applicable, shake test not performed, NAPL category was not assigned to cores where a visual observation of potential NAPL was not confirmed with a shake test
NAPL = nonaqueous phase liquid

Table C4-1
Potential Upland NAPL Sites

Potential Upland NAPL Site	Site ID Numbers Used in 2012 DAR	Site ID Numbers Used in 2015 DAR Addendum	USEPA-Identified Potential Upland NAPL Site[1,2]	DAR-Identified Potential Upland NAPL Sites
Barber Asphalt Paving, Crescent Brick Supply Co.	215	N/A	-	2015 DAR Addendum
Bayside Fuel Oil Depot	51	N/A	Added	2012 DAR
BCF Oil Refining, Inc.	27	N/A	Added	2012 DAR
Borden Ave Bridge	12	N/A	-	2015 DAR Addendum
Borough Asphalt Co.	N/A	34	-	2015 DAR Addendum
BP Brooklyn Terminal	48	N/A	Initial	2012 DAR
Brooklyn Oil Refinery	N/A	5	-	2015 DAR Addendum
Buckeye Pipeline Facility	106	N/A	Added	2012 DAR
Burns Bros Coal & Fuel Oil	N/A	33	-	2015 DAR Addendum
Chelsea Jute Mills	N/A	21	-	2015 DAR Addendum
Chris Cunningham Boiler Works Storage	N/A	16a	-	2015 DAR Addendum
Craycroft Oil Co.	N/A	69	-	2015 DAR Addendum
Empire Merchants / Former Paragon Oil Terminal	200	N/A	Added	2012 DAR and 2015 DAR Addendum
Empire Transit Mix, Inc.	59	N/A	-	2012 DAR and 2015 DAR Addendum
Eppinger & Russel Co Creosoting Works	N/A	8	-	2015 DAR Addendum
Equity Works	33	N/A	Initial	2012 DAR and 2015 DAR Addendum
ESSO Standard Oil / Humble Oil and Refining	N/A	38	-	2015 DAR Addendum
ExxonMobil Greenpoint Remediation Project	53	N/A	Initial	2012 DAR and 2015 DAR Addendum
Former Laurel Hill Site	16	N/A	-	2012 DAR
Getty Terminals Corp. #58220	47	N/A	Initial	2012 DAR
Green Oil Petroleum Corp	N/A	44	-	2015 DAR Addendum
Greenpoint Energy Center	32	N/A	Initial	2012 DAR
Hugo Neu Schnitzer (aka SIMS Hugo Neu)	125	N/A	-	2012 DAR
Indian Refinery Co.	N/A	6	-	2015 DAR Addendum
Interstate Paving Asphalt Plant	218	N/A	-	2015 DAR Addendum
John Groppe Coal Yard, Waterbury Cordage Co.	N/A	27	-	2015 DAR Addendum
Malu Properties / Former Ditmas Oil / Former Gulf Oil	123	N/A	Added	2012 DAR
Manhattan Poly Bag	130	N/A	-	2015 DAR Addendum
Maspeth Concrete Loading	210	N/A	-	2015 DAR Addendum
McKesson Corp / Apollo Street	N/A	N/A	Initial	Not identified in the 2012 DAR or 2015 DAR Addendum
Meehan Paving & Construction Co.	N/A	12	-	2015 DAR Addendum
Mehlen Family Oil Works	N/A	4	-	2015 DAR Addendum
Metro Terminal	52a/b	N/A	-	2015 DAR Addendum
Morgan Oil Terminal, Brooklyn	60	N/A	Initial	2012 DAR and 2015 DAR Addendum
Motiva Brooklyn Terminal	50	N/A	Initial	2012 DAR and 2015 DAR Addendum
New York Paving	214	N/A	-	2015 DAR Addendum
North American Kerosene Gaslight Co.	N/A	40	-	2015 DAR Addendum
Pebble Lane Associates	134	N/A	-	2012 DAR
Quanta Resources	39	N/A	-	2015 DAR Addendum
Review Avenue Development I	41	N/A	Initial	2012 DAR
Scholes Street Holder Station	N/A	N/A	-	2015 DAR Addendum
Sinclair Refining	N/A	1	-	2015 DAR Addendum
Sun Oil	N/A	07	-	2015 DAR Addendum
Texas Co.	N/A	2	-	2015 DAR Addendum
The Brisling Co.	N/A	28	-	2015 DAR Addendum
Uvalde Asphalt	N/A	26	-	2015 DAR Addendum
Waste Management of NY/Steel Equities (formerly POW)	56	N/A	Initial	2012 DAR and 2015 DAR Addendum

Notes:
1 = Initial USEPA-identified potential upland NAPL sites were provided in correspondence between Caroline Kwan and Jim Quadrini on April 2, 2014 (Kwan 2014).
2 = Additional USEPA-identified potential upland sites were added based on subsequent feedback from USEPA.

Acronyms:
DAR = Data Applicability Report
N/A = not applicable
NAPL = nonaqueous phase liquid
USEPA = U.S. Environmental Protection Agency

Reference:
Kwan, C., 2014. Regarding: Newtown – NAPL Delineation. Attachment: Newtown – Cores Requiring NAPL Delineation.pdf. E-mail to: Jim Quadrini. April 2, 2014.

Table C4-2
Summary of the Results of the Category 1B Evaluation

Category 1B Evaluation Area	Number of Category 1A Cores	Number of Category 1B Cores	Number of Phase 1 USEPA-Identified Cores	Number of Phase 1 Archive Cores Processed to Provide Further Characterization and Core Processing Results[1]			Total Number of Cores Evaluated in Category 1B Evaluation[2]	Category 1B Evaluation Conclusion
				Category 1A	Category 1B	Category 2/3		
A	7	3	None	None	None	None	3	No further evaluation
B	17	6	3	None	2	None	11	No further evaluation
C	6	5	7	1	2	None	15	No further evaluation
CM 2.2	3	3	2	None	2	None	7	No further evaluation
D	3	5	None	None	None	None	5	No further evaluation
E	8	2	1	None	None	1	4	Based on visual observations in the processed Phase 1 archive core NC069SC-B; NC069SC-B is a Category 2/3 core. Therefore, core NC069SC-B and adjacent cores NC069SC-A and NC069ASC will be included in the Turning Basin Category 2/3 Evaluation.
F	2	4	None	None	None	None	4	No further evaluation
G	13	6	None	None	None	None	6	No further evaluation
H	11	2	4	2	None	None	8	No further evaluation
Total for Category 1B Areas	**70**	**36**	**17**	**3**	**6**	**1**	**63**	

Notes:
1 = A total of ten Phase 1 archive cores were processed using Phase 2 field methods.
2 = The evaluation included Category 1B cores, Phase 1 USEPA-identified cores, and all Phase 1 archive cores processed to provide further characterization of Category 1B areas.

Acronyms:
CM = creek mile
USEPA = U.S. Environmental Protection Agency

Table C4-3
Category 1B Evaluation Step 1 – Initial Evaluation

Category 1B Evaluation Area	Core Evaluated	Core Type	Adjacent to USEPA-Identified NAPL Site	Most Notable Visual Observation	Most Notable Shake Test Result	Maximum Shake Test Bleb Rank	Rationale for Conclusion	Conclusion
A	NC251SC-A	Phase 2 Subsurface	No	Blebs	Blebs	2	Phase 2 data indicate no further evaluation; nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
A	NC267SC-A	Phase 2 Groundwater	No	Sheen	Blebs	1		
A	NC254SC-G	Phase 2 Subsurface	No	Blebs	Blebs	3	Shake test resulting in rank 3 blebs	Additional evaluation
B	NC012SC-F	Phase 2 Subsurface	No	Sheen	Blebs	2	Nearby Phase 2 data and collocated cores with no visual impacts and negative shake tests	No further evaluation
B	NC258SC-A	Phase 2 Subsurface	No	Blebs	Blebs	2		
B	NC258SC-F	Phase 2 Subsurface	No	Blebs	Blebs	2		
B	NC022CSC	USEPA-Identified Phase 1	No	Oil-wetted	N/A	N/A		
B	NC023ASC	USEPA-Identified Phase 1	No	Sheen	N/A	N/A		
B	NC259SC-A	Phase 2 Subsurface	No	Blebs	Blebs	2		
B	NC271SC-A	Phase 2 Groundwater	No	Saturated	Blebs	2	Observation of saturated sediment	Additional evaluation
B	NC016BSC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A	Nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
C	NC032ASC	USEPA-Identified Phase 1	Yes	Oil-wetted	N/A	N/A	Core is adjacent to potential NAPL upland area	Additional evaluation
C	NC261SC-A	Phase 2 Subsurface	Yes	Blebs	Blebs	2	Cores are adjacent to potential NAPL upland area	Additional evaluation
C	NC277SC-A	Phase 2 Groundwater	Yes	Blebs	Blebs	2		
C	NC276SC-A	Phase 2 Groundwater	No	Sheen	Blebs	3	Shake test resulting in rank 3 blebs	Additional evaluation
C	NC036BSC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A	Adjacent to core NC276SC-A with rank 3 blebs	No further evaluation
C	NC036CSC	USEPA-Identified Phase 1	No	Oil-coated	N/A	N/A		
C	NC044ASC	USEPA-Identified Phase 1	No	Oil-wetted	N/A	N/A	Phase 2 data indicate no further evaluation (confirmed by archive core NC044SC-B processed to further characterize adjacent Category 2/3 Area)	No further evaluation
C	NC044SC-B	Processed Phase 1 Archive	No	Sheen	Blebs	1	Archive core processed to further characterize adjacent Category 2/3 Area	No further evaluation
C	NC045BSC	USEPA-Identified Phase 1	Yes	Oil-stained	N/A	N/A	Cores are adjacent to potential NAPL upland area	Additional evaluation
C	NC045SC-A	Processed Phase 1 Archive	Yes	None	Blebs	2	Archive core processed to further characterize adjacent Category 2/3 Area	No further evaluation
C	NC030BSC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A	Phase 2 data indicate no further evaluation	No further evaluation
C	NC037ASC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A		
C	NC037SC-D	Phase 2 Subsurface	No	Blebs	Blebs	2		
C	NC278SC-A	Phase 2 Groundwater	No	Sheen	Blebs	2		
CM 2.2	NC282SC-A	Phase 2 Groundwater	Yes	Sheen	Blebs	2	Core is adjacent to potential NAPL upland area	Additional evaluation
CM 2.2	NC051ASC	USEPA-Identified Phase 1	Yes	Oil-stained	N/A	N/A		
CM 2.2	NC051SC-B	Processed Phase 1 Archive	Yes	Blebs	Blebs	2	Archive core processed to further characterize adjacent Category 2/3 Area	No further evaluation
CM 2.2	NC055ASC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A	Nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
CM 2.2	NC284SC-A	Phase 2 Groundwater	No	Sheen	Blebs	2		
CM 2.2	NC263SC-C	Phase 2 Subsurface	No	Blebs	Blebs	2		
CM 2.2	NC055SC-B	Processed Phase 1 Archive	No	Sheen	Blebs	2	Archive core processed to further characterize adjacent Category 2/3 Area	No further evaluation

Table C4-3
Category 1B Evaluation Step 1 – Initial Evaluation

Category 1B Evaluation Area	Core Evaluated	Core Type	Adjacent to USEPA-Identified NAPL Site	Most Notable Visual Observation	Most Notable Shake Test Result	Maximum Shake Test Bleb Rank	Rationale for Conclusion	Conclusion
D	NC264SC-B	Phase 2 Subsurface	No	Blebs	Blebs	2	Nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
D	NC306SC-C	Phase 2 Subsurface	No	Blebs	Blebs	2		
D	NC229SC-A	Phase 2 Subsurface	No	Blebs	Blebs	2		
D	NC230SC-A	Phase 2 Subsurface	No	Blebs	Blebs	2		
D	NC174SC-D	Phase 2 Subsurface	No	Blebs	Blebs	2		
E	NC176SC-A	Phase 2 Subsurface	No	Blebs	Blebs	2	Nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
E	NC069SC-A	Phase 2 Groundwater	Yes	Saturated	Blebs	4	Core is adjacent to potential NAPL upland area; shake test resulting in rank 4 blebs; adjacent to Category 2/3 core NC069SC-B	Additional evaluation
E	NC069ASC	USEPA-Identified Phase 1	Yes	Oil-stained	N/A	N/A	Adjacent to potential USEPA-identified NAPL site; adjacent to core NC069SC-A with rank 4 blebs; adjacent to Category 2/3 core NC069SC-B	Additional evaluation
F	MC029SC-A	Phase 2 Groundwater	No	Sheen	Blebs	2	Nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
F	MC005SC-E	Phase 2 Subsurface	No	Blebs	Blebs	2		
F	MC007SC-A	Phase 2 Subsurface	No	Blebs	Blebs	1		
F	MC007SC-C	Phase 2 Subsurface	No	Blebs	Blebs	2		
G	EB045SC-A	Phase 2 Subsurface	No	None	Blebs	1	Nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
G	EB006SC-A	Phase 2 Subsurface	No	Blebs	Blebs	1		
G	EB040SC-A	Phase 2 Subsurface	No	Sheen	Blebs	2		
G	EK078SC-C	Phase 2 Subsurface	No	Blebs	Blebs	3	Shake test resulting in rank 3 blebs	Additional evaluation
G	EB040SC-D	Phase 2 Subsurface	No	Sheen	Blebs	3		
G	EB040SC-E	Phase 2 Subsurface	No	Blebs	Blebs	3		
H	EK083SC-C	Phase 2 Subsurface	No	Sheen	Blebs	3	Shake test resulting in rank 3 blebs	Additional evaluation
H	EK085SC-D	Phase 2 Subsurface	No	Blebs	Blebs	2	Nearby Phase 2 cores with no visual impacts and negative shake tests	No further evaluation
H	EK018ASC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A		
H	EK007ASC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A	Phase 2 data indicate no further evaluation (confirmed by archive core EK007SC-B processed to further characterize adjacent Category 2/3 Area)	No further evaluation
H	EK009ASC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A	Phase 2 data indicate no further evaluation needed (confirmed by processed archive core EK008SC-B processed to further characterize adjacent Category 2/3 Area)	No further evaluation
H	EK009CSC	USEPA-Identified Phase 1	No	Oil-stained	N/A	N/A		
H	EK007SC-B	Processed Phase 1 Archive	No	Sheen	Sheen	NB	Archive core processed to further characterize adjacent Category 2/3 Area	No further evaluation
H	EK008SC-B	Processed Phase 1 Archive	No	None	Sheen	NB		

Acronyms:
N/A = not applicable (core not shake tested)
NAPL = nonaqueous phase liquid
NB = no blebs observed in shake test
None = no sheen or NAPL found, most notable visual observation not applicable
USEPA = U.S. Environmental Protection Agency

Table C4-4
Category 1B Evaluation Step 2 – Additional Evaluation

Category 1B Evaluation Area	Core Evaluated	Rationale for Additional Evaluation	Observations of NAPL or Oil					Rationale for Conclusion	Conclusion
			Shake Test Bleb		Visual Observations				
			Bleb Rank	Depth (cm)	Observation	Start Depth	End Depth		
A	NC254SC-G	Rank 3 blebs	3	80	Blebs	75	84	Sediment visual observations: bleb observation confined to thin discontinuous sandy silt layer. Nearby cores show no significant visual impacts.	No further evaluation.
B	NC271SC-A	Saturated visual observation	2	184	Saturated	182	188	Sediment visual observations: saturated observation confined to thin continuous later.	Further evaluation: - Analyze Phase 1 archive cores (NC022SC-B, NC023SC-B). - Collect collocated cores (NC271SC-B and NC271SC-C).
C	NC032ASC	Adjacent to upland NAPL site	N/A	N/A	Oil-wetted	62	69	Nearby Phase 2 core shows no visual impacts, negative shake test.	No further evaluation. - Phase 2 data also indicate no further evaluation needed at USEPA-identified core NC030.
					Oil-coated	69	302		
C	NC261SC-A	Adjacent to upland NAPL site	2	100	Blebs	90	100	Sediment visual observations: lithology does not explain shake test bleb observations.	No further evaluation.
			2	120	Blebs	100	120		
C	NC277SC-A	Adjacent to upland NAPL site	2	140	Blebs	107	152	Sediment visual observations: lithology does not explain shake test bleb observations.	No further evaluation.
C	NC276SC-A	Rank 3 blebs	3	80	Sheen	60	110	Inferred blebs from 22 to 24 cm, 44 to 54 cm, and 130 to 180 cm; blebs are present in sediment near surface.	Further evaluation: - Analyze Phase 1 archive core NC036.
			2	228	Sheen	213	233		
C	NC045BSC	Adjacent to upland NAPL site	N/A	N/A	Oil-stained	63	119	Two nearest Phase 2 cores show no visual impacts, negative shake test; further confirmed by processing archive core NC045SC-A.	No further evaluation: - Phase 2 data also indicate no further evaluation needed at USEPA-identified core NC044.
CM 2.2	NC051ASC	Adjacent to upland NAPL site	N/A	N/A	Oil-stained	150 186	184 322	Oil-stained visual observations.	No further evaluation.
CM 2.2	NC282SC-A	Adjacent to upland NAPL site	2	182	Sheen	170	201	Sediment visual observations: lithology does not explain shake test bleb observation.	No further evaluation.
E	NC069SC-A	Adjacent to upland NAPL site	4	479	Saturated	475	479	Blebs are present in native material directly below sediment. Sediment visual observations: - Blebs in sediment at 457 to 475 cm. - Saturated thin (4-cm) coarse-grained upper native material lens at 475 to 479 cm. - Blebs in native material at 490 to 500 cm. Nearby stations: - NC069ASC Phase 1 core oil-staining in sediments directly above native material interface. - GPEC-SED20 saturated in native material directly below sediment in coarse-grained material from 254 to 284 cm below surface. - No visual impacts were reported in native material in the rest of the Area E cores.	Further evaluation: - Analyze Phase 1 archive core NC069.
E	NC069ASC	Adjacent to upland NAPL site	N/A	N/A	Oil-stained	262	274	Sediment visual observation: oil-staining in sediments directly above native material interface.	Further evaluation: - Analyze Phase 1 archive core NC069.

Table C4-4
Category 1B Evaluation Step 2 – Additional Evaluation

Category 1B Evaluation Area	Core Evaluated	Rationale for Additional Evaluation	Observations of NAPL or Oil					Rationale for Conclusion	Conclusion
			Shake Test Bleb		Visual Observations				
			Bleb Rank	Depth (cm)	Observation	Start Depth	End Depth		
G	EK078SC-C	Rank 3 blebs	3	70	Blebs	60	90	Blebs present in sediment directly above native material. Sediment visual observations: sediment composition consistent throughout vertical profile (silt). Nearby cores show no visual impacts.	No further evaluation.
	EB040SC-D	Rank 3 blebs	3	300	Sheen	290	355	Sediment visual observations: shake test bleb observations primarily present in coarser-grained materials. Other nearby stations show no visual impacts and no blebs.	No further evaluation.
			1	400	Sheen	377	406		
	EB040SC-E	Rank 3 blebs	3	150	Blebs	150	208		
H	EK083SC-C	Rank 3 blebs	3	300	Sheen	290	300	Sediment visual observations: lithology does not explain shake test bleb observations. Nearby Phase 1 and Phase 2 cores show no visual impacts, negative shake tests.	No further evaluation: - Phase 2 data also indicate no further evaluation needed at USEPA-identified cores EK007 and EK009.

Acronyms:
cm = centimeter
CM = creek mile
N/A = Phase 1 core, not shake tested
NAPL = nonaqueous phase liquid
USEPA = U.S. Environmental Protection Agency

Table C4-5
Category 1B Evaluation Step 3 – Further Evaluation

Category 1B Evaluation Area	Processed Phase 1 Archive Core or Phase 2 Core Collected to Provide Additional Characterization	Rationale for Core Processing	Most Notable Core Observations (cm below mudline)						Rationale for Conclusion	Conclusion
			Shake Test Result		Visual Observation					
			Observation	Depth	Observation	Start Depth	End Depth	Depth to Native		
B	NC022SC-B	Saturated visual observation in nearby core NC271SC-A	Blebs (rank 3)	137	Sheen	116	174	174	Blebs present in sediment directly above native material. Nearby cores: - Shake test blebs in NC271SC-A, NC258SC-A, and NC023SC-B located along adjacent Brooklyn shoreline present in sediment directly above native material. - Stations NC161, NC270, and NC272 no visual impacts, negative shake tests.	No further evaluation.
B	NC023SC-B	Saturated visual observation in nearby core NC271SC-A	Blebs (rank 2)	183	Sheen	107	207	241	Blebs present in sediment directly above native material. Nearby cores: - Shake test blebs in NC271SC-A, NC258SC-A, and NC022SC-B located along adjacent Brooklyn shoreline present in sediment directly above native material. - Stations NC161, NC270, and NC272 no visual impacts, negative shake tests.	No further evaluation.
B	NC271SC-B	Saturated visual observation in nearby core NC271SC-A	No sheen or NAPL	NA	Sheen	0	128	NE	Three shake tests in sediment: - No NAPL observed.	NAPL was not observed visually nor in shake tests. No further evaluation.
B	NC271SC-C	Saturated visual observation in nearby core NC271SC-A	Blebs (rank 3)	131	Sheen	0	145	NE	Sediment visual observations: - Lithology, with a lack of coarse-grained sediment that has been observed in other samples with similar shake test results, is not consistent with shake test bleb observations. Nearby cores: - Collocated NC271SC-B has no visual NAPL impact, three negative shake tests. - Shake test blebs in NC271SC-A, NC023SC-B, NC022SC-B, and NC258-A, located along adjacent Brooklyn shoreline present in sediment directly above native material. - Stations NC161, NC270, and NC272 no visual impacts, negative shake tests.	No further evaluation.
C	NC036SC-A	Adjacent to NC276SC-A with rank 3 blebs and to two USEPA-identified cores NC036BSC and NC036CSC	Sheen	45; 85	Sheen	24	100	131	Five shake tests in sediment: - No NAPL observed. Three shake tests in native material: - No NAPL observed.	NAPL was not observed visually nor in shake tests. No further evaluation.
E	NC069SC-B	Adjacent to potential USEPA-identified NAPL site and to NC069SC-A with rank 4 blebs	Layer	322	Coated	322	324	300	Sediment visual observations: - Coated thin (3-cm) coarse-grained material at native interface at 301 to 304 cm. - Observed in silty sand layer, similar to saturated observed at NC069SC-A.	Based on layer shake test and coated visual observations, NC069SC-B is a Category 2/3 core, and Area E has been adjusted to exclude this core. The excluded portion of Area E is carried forward into the next step of the evaluation and included as part of the Turning Basin Category 2/3 Evaluation Area. NC069SC-B and adjacent cores NC069SC-A and NC069ASC are assigned as Turning Basin Category 2/3 Evaluation Area cores.

Acronyms:
cm = centimeter
NA = not available
NAPL = nonaqueous phase liquid
NE = native material not encountered
USEPA = U.S. Environmental Protection Agency

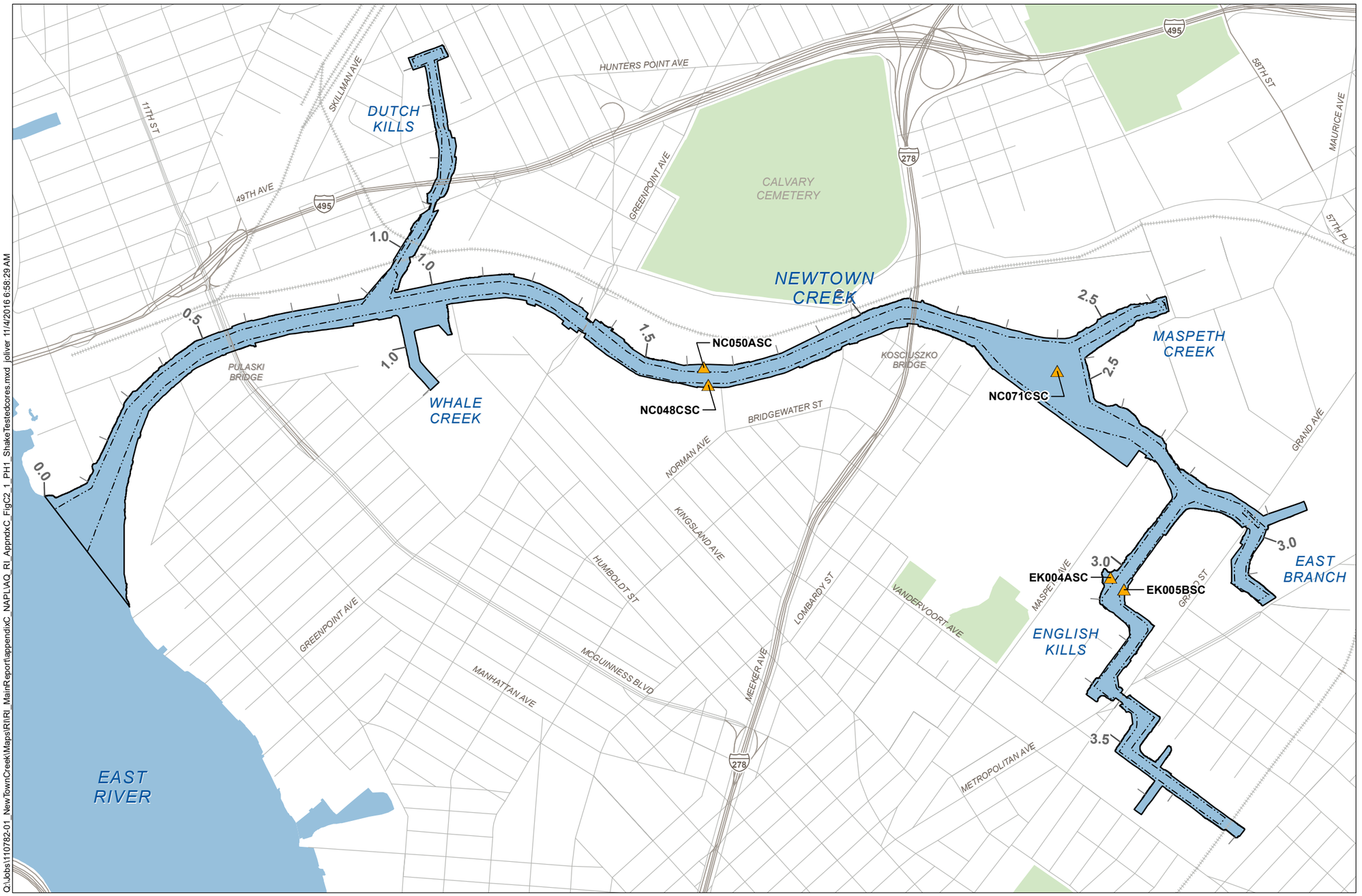
Table C4-6
Phase 1 Archive Cores Processed to Further Characterize Category 2/3 Areas

Category 2/3 Evaluation	Core ID	Rationale for Processing	Core Observations
CM 1.7	NC044SC-B	Processed at request of USEPA	No Category 2/3 NAPL observations (no visual observations of NAPL) No positive Category 2/3 NAPL shake test results (maximum shake test bleb rank 1)
CM 1.7	NC045SC-A	Delineate shake test layer in core NC048CSC within oil-stained sediment	No visual observations of Category 2/3 NAPL No positive Category 2/3 shake test results (maximum shake test bleb rank 2)
CM 1.7	NC048SC-E	Delineate shake test layer in core NC048CSC within oil-stained sediment	No Category 2/3 NAPL observations (visual observation of blebs in coarser-grained lenses, similar to NC048CSC) Maximum shake test bleb rank 3
CM 1.7	NC049ASC	Delineate shake test layer in core NC048CSC within oil-stained sediment	No Category 2/3 NAPL observations (visual observations of blebs)
		Evaluate lateral extent of NAPL observed in NC050ASC – positive shake test in 1-cm-thick layer in gray sand at sediment-native material interface	No positive Category 2/3 NAPL shake test results (maximum shake test bleb rank 1)
CM 1.7	NC050SC-B	Evaluate lateral extent of NAPL observed in NC050ASC – positive shake test in 1-cm-thick layer in gray sand at sediment-native material interface	No visual observations of Category 2/3 NAPL (visual observation of oil-stained sediment)
		Evaluate NAPL observed in NC262SC-A – visual blebs/shake test layer in 3-cm-thick layer in gray sand at sediment-native material interface	Negative shake tests
CM 1.7	NC051SC-B[1]	Evaluate full thickness of sediment and lateral extent of shake test blebs in core NC282SC-A	No Category 2/3 NAPL observations (visual observations of blebs) No positive Category 2/3 NAPL shake test results (maximum shake test bleb rank 2) To be evaluated as part of Category 1B Evaluation Area CM 2.2
CM 1.7	NC055SC-B[1]	Processed at request of USEPA	No Category 2/3 NAPL observations (no visual observations of NAPL) No positive Category 2/3 NAPL shake test results (maximum shake test bleb rank 2) To be evaluated as part of Category 1B Evaluation Area CM 2.2
English Kills	EK007SC-B	Processed at request of USEPA	No Category 2/3 NAPL observations (no visual observations of NAPL) No positive Category 2/3 NAPL shake test results (maximum shake test bleb rank 2)
English Kills	EK008SC-B	Processed at request of USEPA	No Category 2/3 NAPL observations (no visual observations of NAPL) No positive Category 2/3 NAPL shake test results (maximum shake test bleb rank 2)
Turning Basin	NC069SC-B[2]	Further evaluate NAPL observed in core NC069SC-A, including shake test bleb rank 4 (depth 15.6 to 15.7 feet), blebs in sediment (depth 15.0 to 15.6 feet), and blebs in native material 16.1 to 16.4 feet	Category 2/3 NAPL coated observation in a 2-cm layer 10.6 feet below the sediment surface at the sediment-native material interface
		Oil-staining observed directly above the sediment-native material interface in NC069ASC Native material saturated directly below sediment in GPEC-SED20 at depth 8.3 to 9.3 feet	Positive shake test layer results 10.6 feet below sediment surface
Turning Basin	NC072SC-B	Processed at request of USEPA	Category 2/3 NAPL coated observations ranging from 4 to 13 cm at 9.7, 10.7, and 11.8 feet below sediment surface Maximum shake test bleb rank 3 at 9.7 feet below sediment surface
Turning Basin	NC073SC-A	Processed at request of USEPA	No Category 2/3 NAPL observations (visual observations of blebs) No positive Category 2/3 NAPL shake test results (maximum shake test bleb rank 2)
Turning Basin	NC074SC-B	Processed at request of USEPA	No Category 2/3 NAPL observations (no visual observations of NAPL) No positive Category 2/3 NAPL shake test results (negative shake test results)

Notes:
1 = Phase 1 archive core processed to support CM 1.7 Category 2/3 NAPL Evaluation. Due to the lack of Category 2/3 NAPL observations in this core, Category 1B Area CM 2.2 has been extended downstream from its original location to include this core.
2 = Phase 1 archive core processed to support Category 1B Area E Evaluation. Due to the presence of Category 2/3 NAPL observations in this core, Category 1B Area E has been adjusted to exclude this core. The excluded portion of Category 1B Area E is included as part of the Turning Basin Category 2/3 NAPL Area.

Acronyms:
cm = centimeter
CM = creek mile
NAPL = nonaqueous phase liquid
USEPA = U.S. Environmental Protection Agency

FIGURES



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel
Phase 1 Shake-Tested Core Station

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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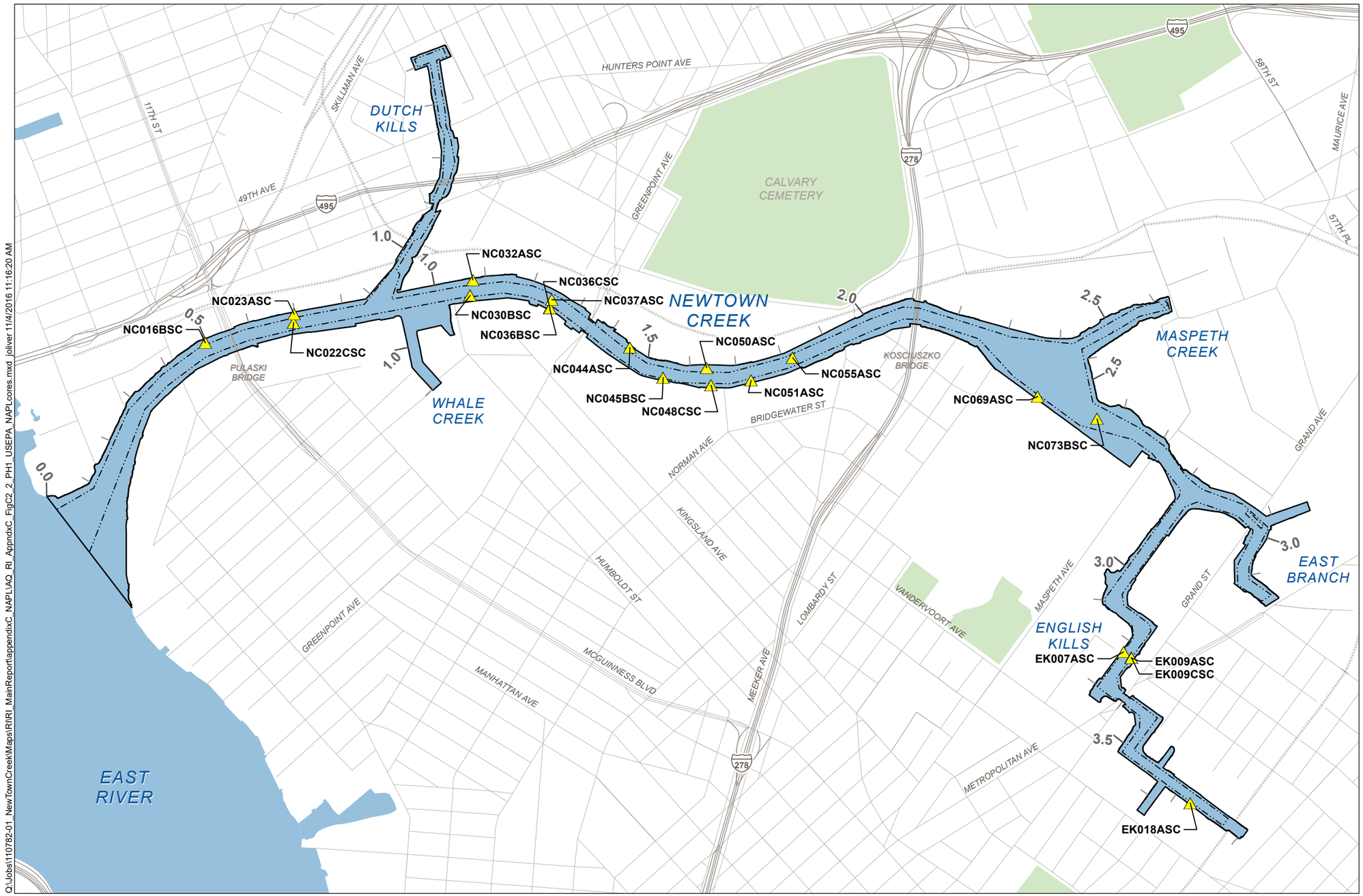
Figure C2-1
Phase 1 Shake-Tested Cores
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel
Phase 1 USEPA-identified NAPL Core Station

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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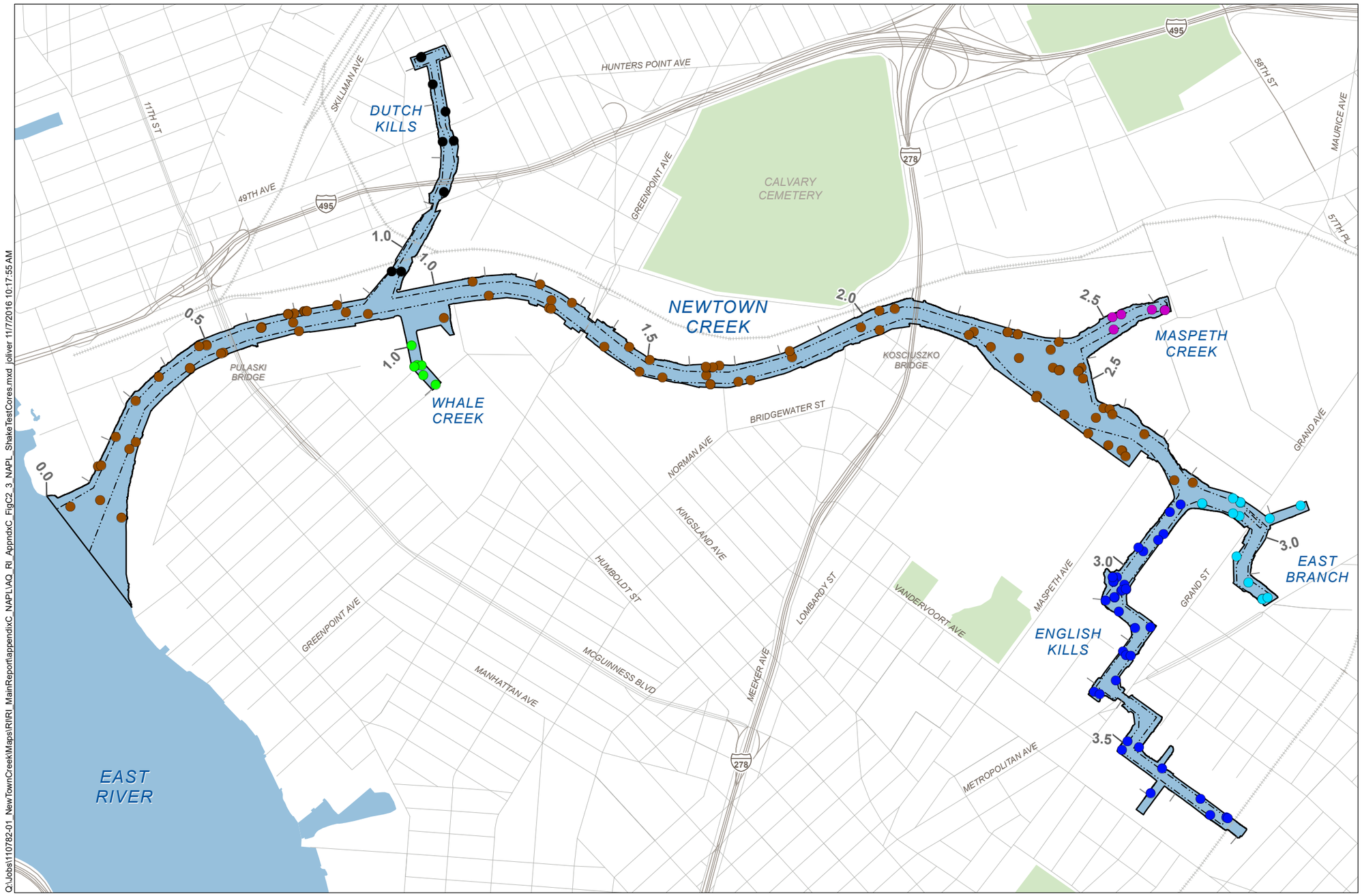
Figure C2-2
Phase 1 USEPA-Identified NAPL Cores
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel

Core Stations with at Least One Shake Test

- Dutch Kills
- East Branch
- English Kills
- Maspeth Creek
- Newtown Creek
- Whale Creek

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Shake-tested cores were collected during Phase 1 and Phase 2 field programs.
3. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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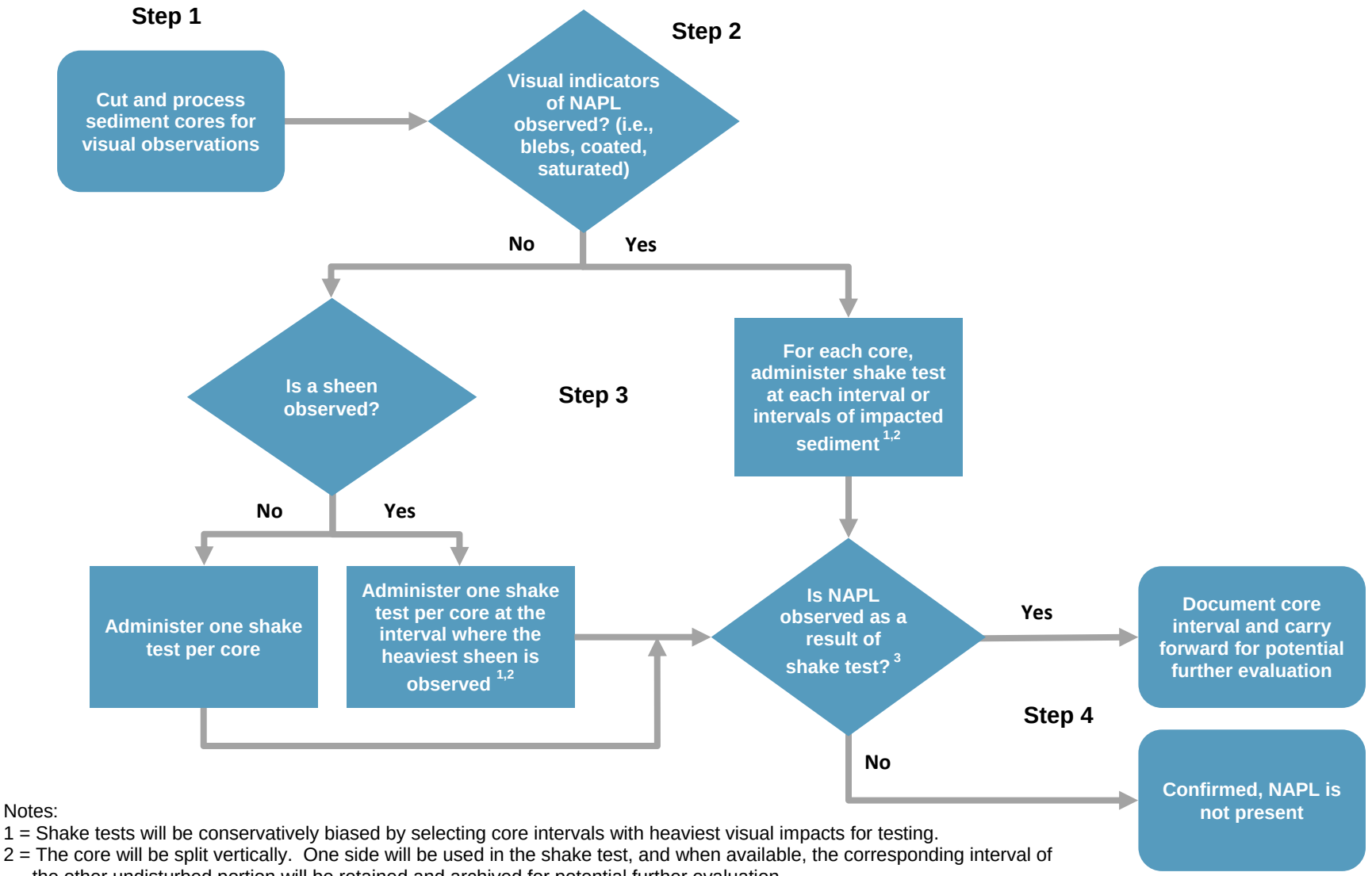
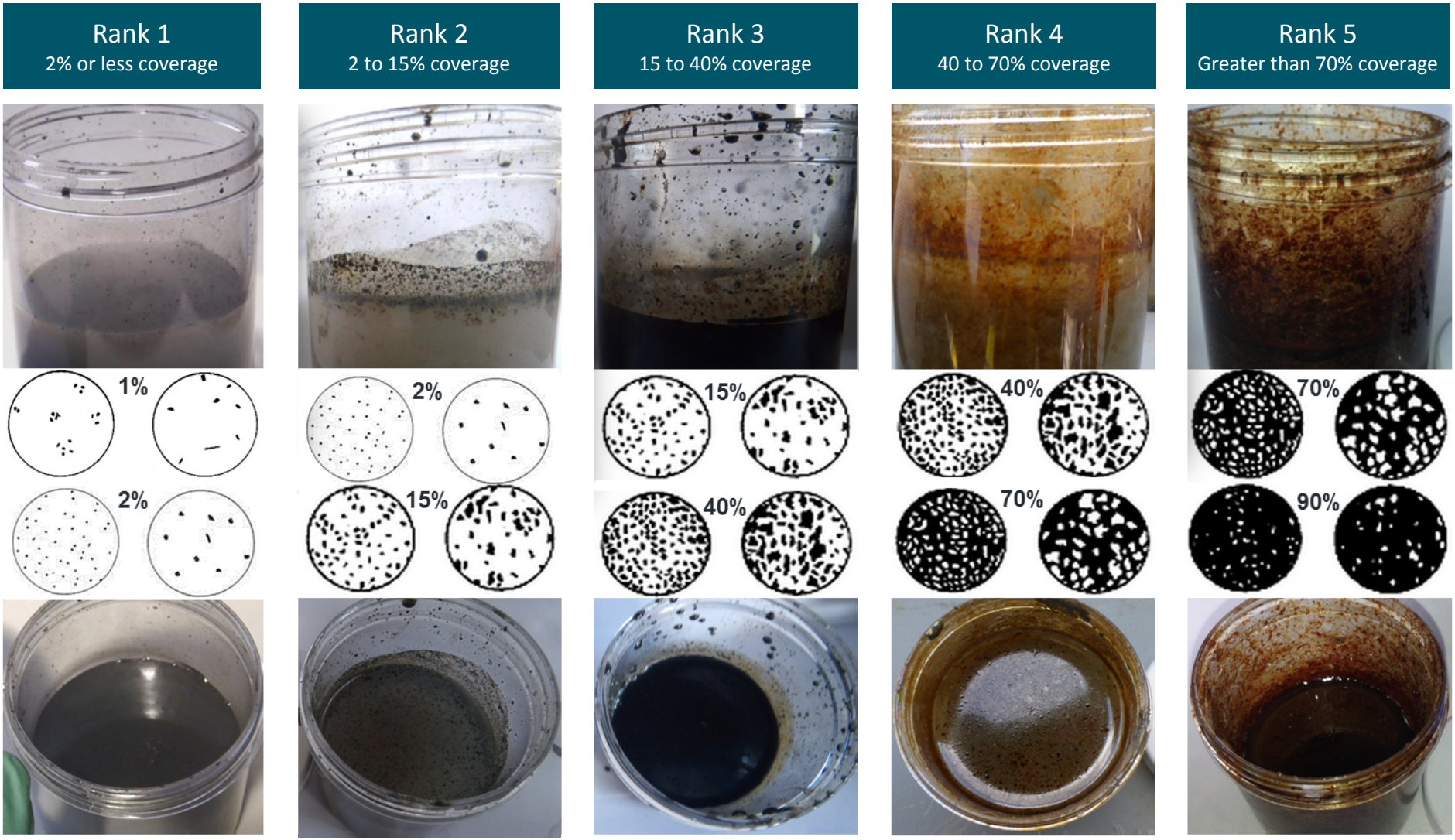
Figure C2-3
Cores Processed Using Phase 2 Methods
NAPL Evaluation
Newtown Creek RI/FS



Notes:
1 = Shake tests will be conservatively biased by selecting core intervals with heaviest visual impacts for testing.
2 = The core will be split vertically. One side will be used in the shake test, and when available, the corresponding interval of the other undisturbed portion will be retained and archived for potential further evaluation.
3 = Observation of sheen only is not considered nonaqueous phase liquid (Kwan 2014a).

Figure C2-4
Flow Diagram for Field Identification of NAPL
NAPL Evaluation
Newtown Creek RI/FS



Note: Comparison charts for visual estimation depicted above from the *Manual of Field Geology* (Compton 1962).

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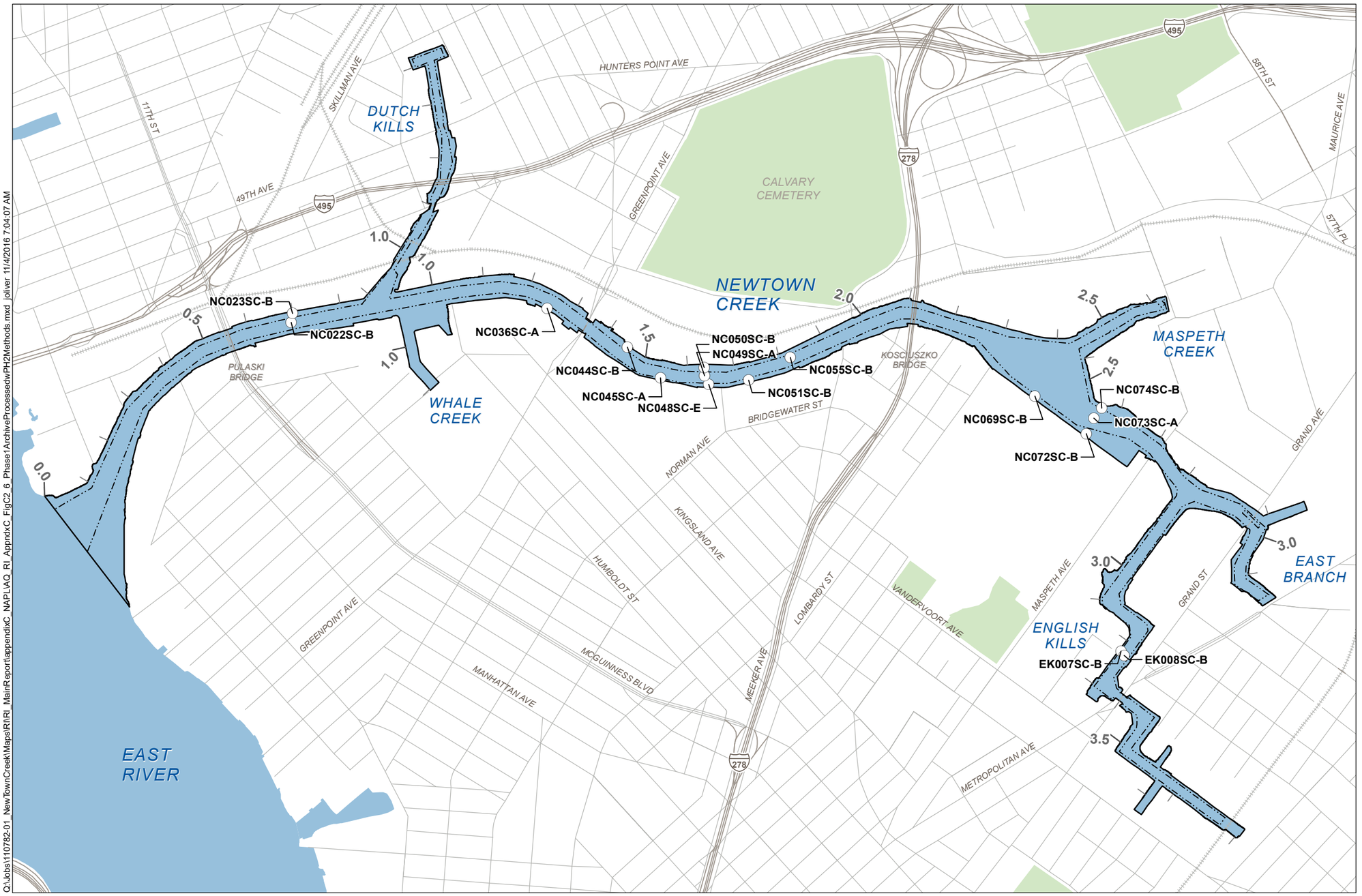
Figure C2-5
Shake Test Bleb Rank Scale
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel
Phase 1 Archive Core Station with Shake Test

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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Figure C2-6
Phase 1 Archive Cores Processed Using Phase 2 Methods
NAPL Evaluation
Newtown Creek RI/FS

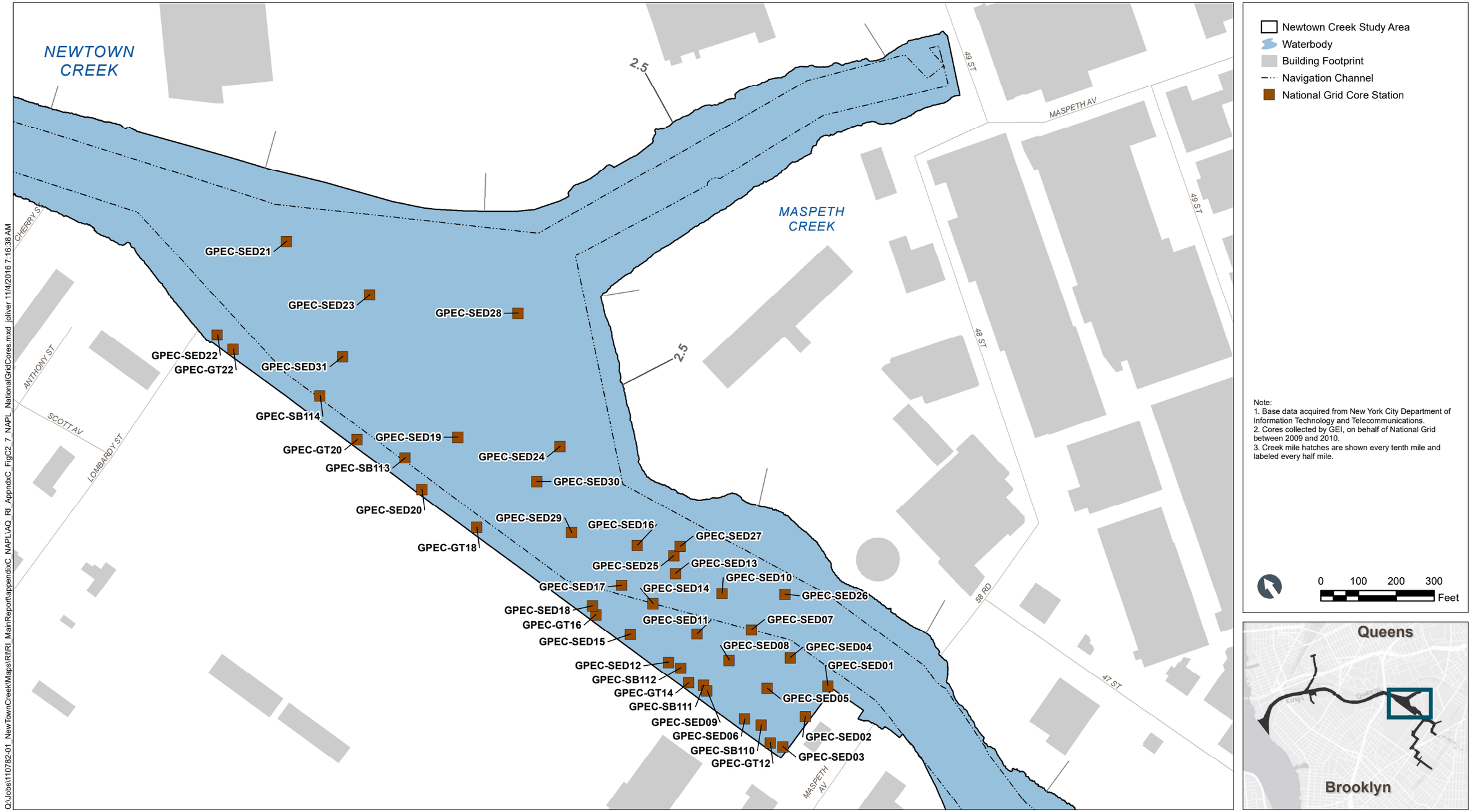

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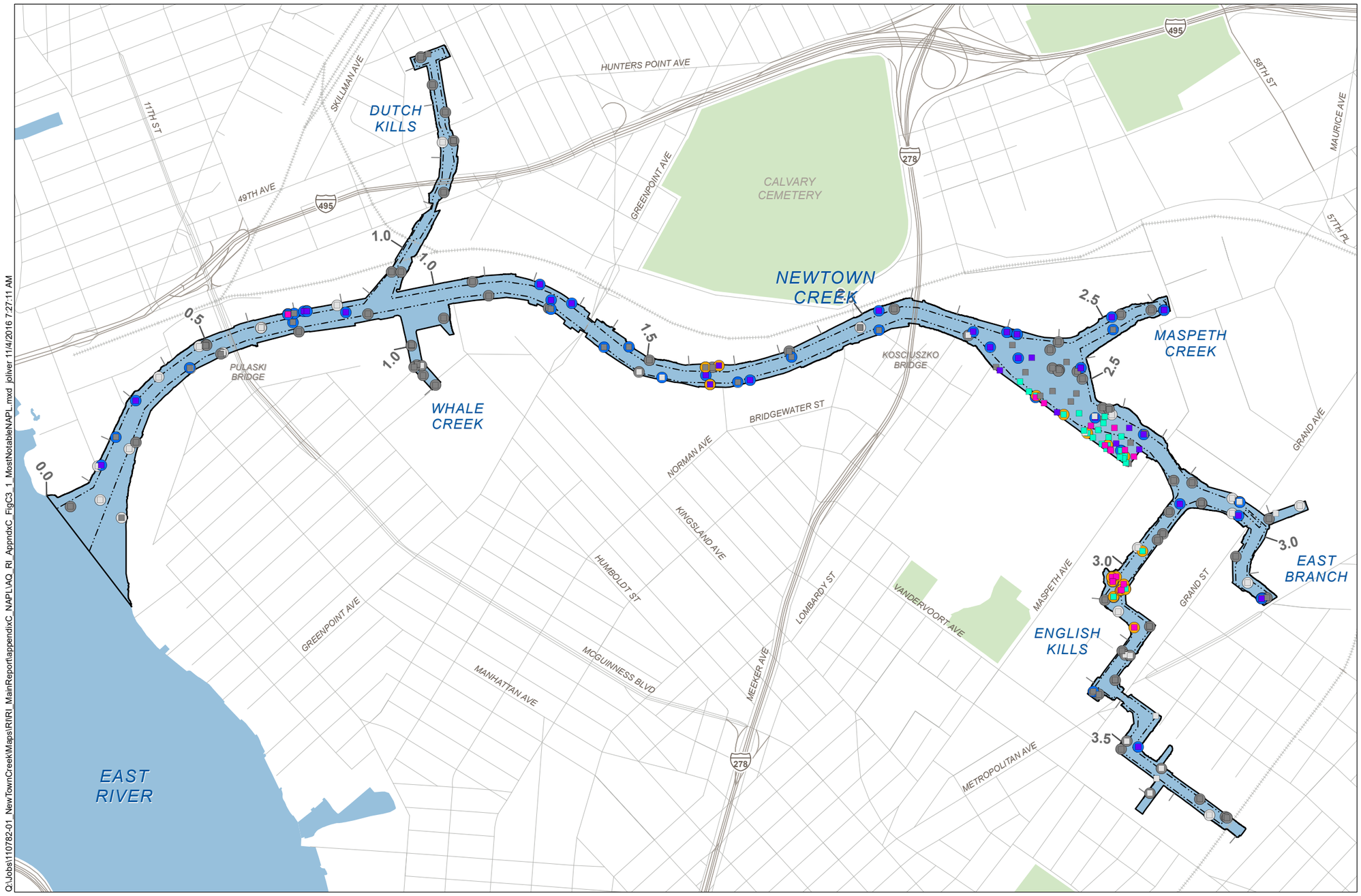
Figure C2-7
National Grid Cores Included in the NAPL Evaluation
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel

Most Notable NAPL Observation in Core

Visual Observation
- Saturated
- Coated
- Blebs
- Sheen
- No Visual Observation

Shake Test
- Layer
- Blebs
- Sheen
- Negative

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Cores shown were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
3. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

Q:\Jobs\110782-01_NewTownCreek\Maps\RI\RI_MainReport\appendixC_NAPL\AQ_RI_AppndxC_FigC3_1_MostNotableNAPL.mxd jolliver 11/4/2016 7:27:11 AM

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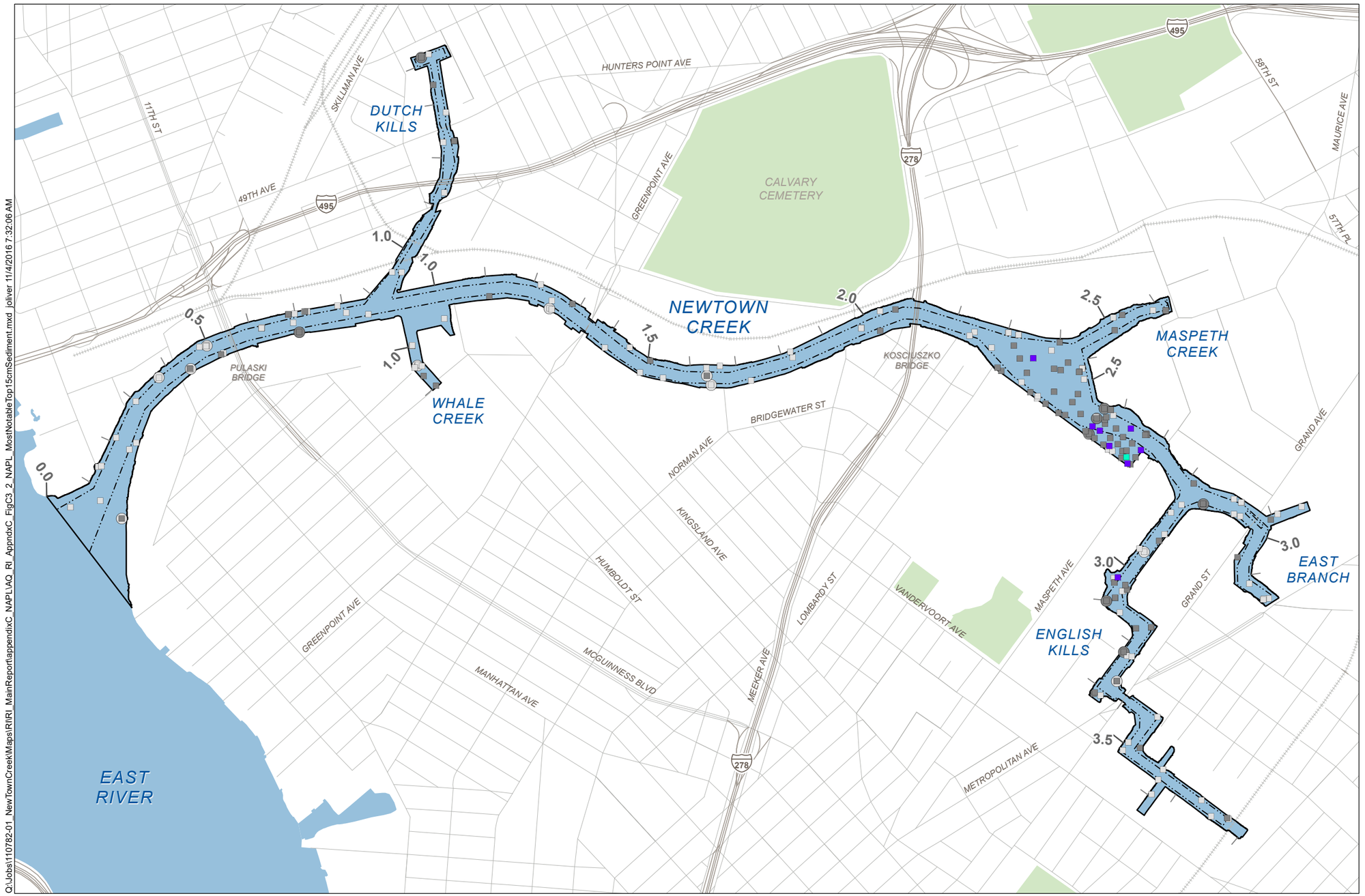
Figure C3-1
Most Notable NAPL Observations
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel

Most Notable NAPL Observation in Top 15 cm of Sediment

Visual Observation

- Saturated
- Coated
- Blebs
- Sheen
- No Visual Observation

Shake Test

- Layer
- Blebs
- Sheen
- Negative

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Cores shown were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
3. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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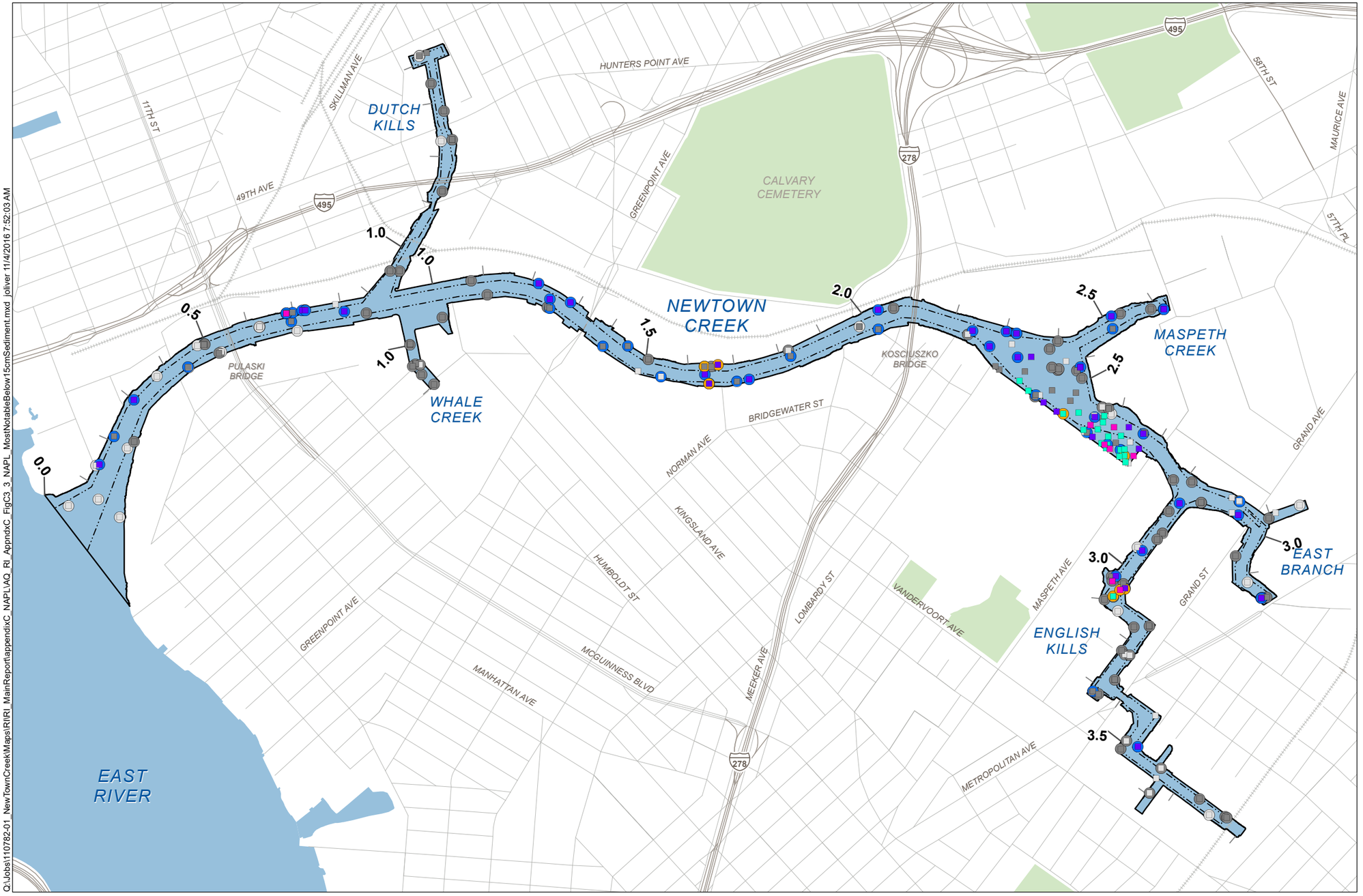
Figure C3-2
Most Notable NAPL Observations in Surface Sediment
NAPL Evaluation
Newtown Creek RI/FS

Q:\Jobs\110782-01_NewTownCreek\Maps\RI\RI_MainReport\appendixC_NAPL\AQ_RI_AppndxC_FigC3_3_NAPL_MostNotableBelow15cmSediment.mxd jolliver 11/4/2016 7:52:03 AM



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel

Most Notable NAPL Observation from below 15 cm to Native Material Surface

Visual Observation

- Saturated
- Coated
- Blebs
- Sheen
- No Visual Observation

Shake Test

- Layer
- Blebs
- Sheen
- Negative

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Cores shown were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
3. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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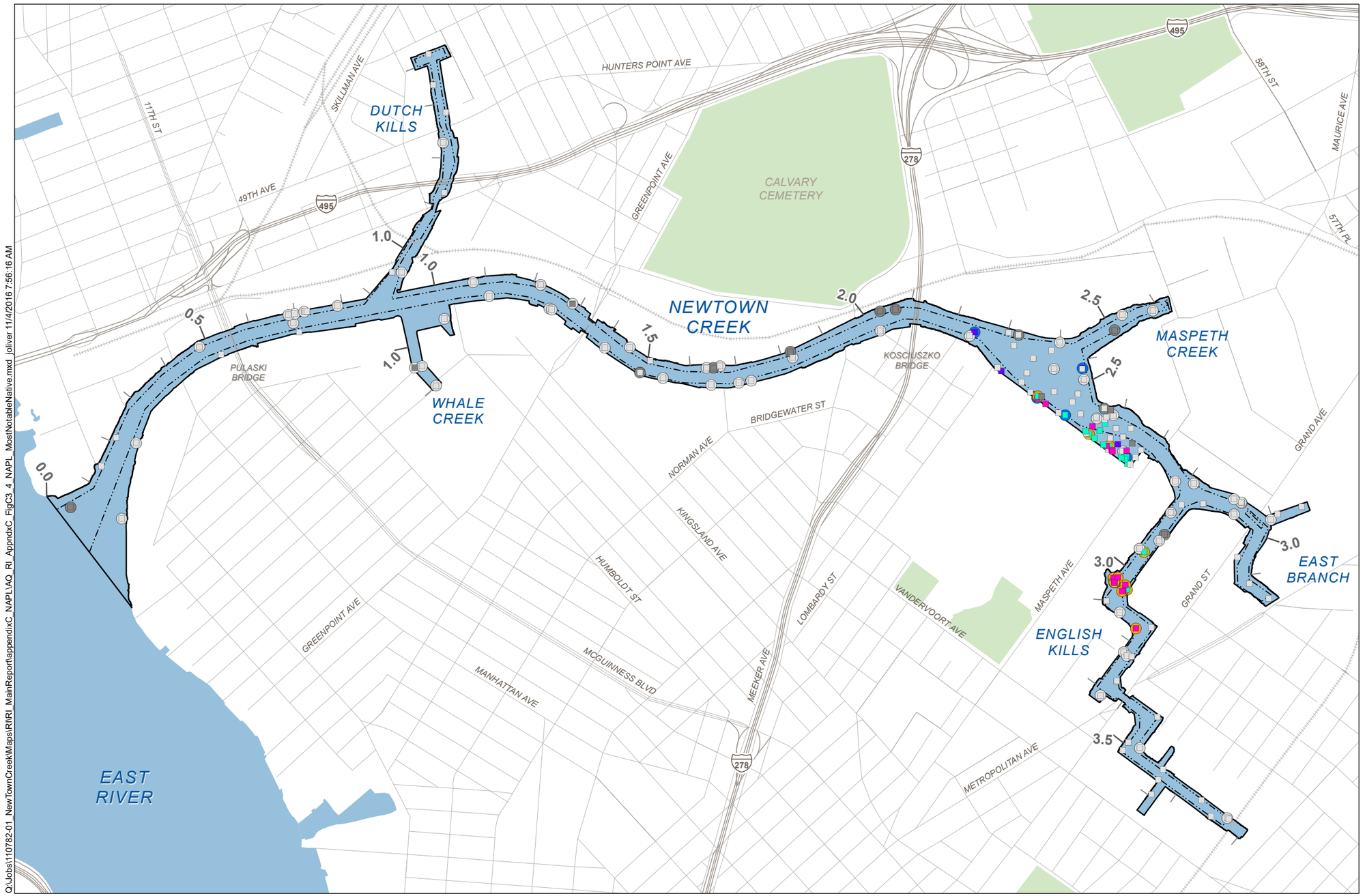
Figure C3-3
Most Notable NAPL Observations in Subsurface Sediment
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel

Most Notable NAPL Observation in Native Material

Visual Observation

- Saturated
- Coated
- Blebs
- Sheen
- No Visual Observation

Shake Test

- Layer
- Blebs
- Sheen
- Negative

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Cores shown were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
3. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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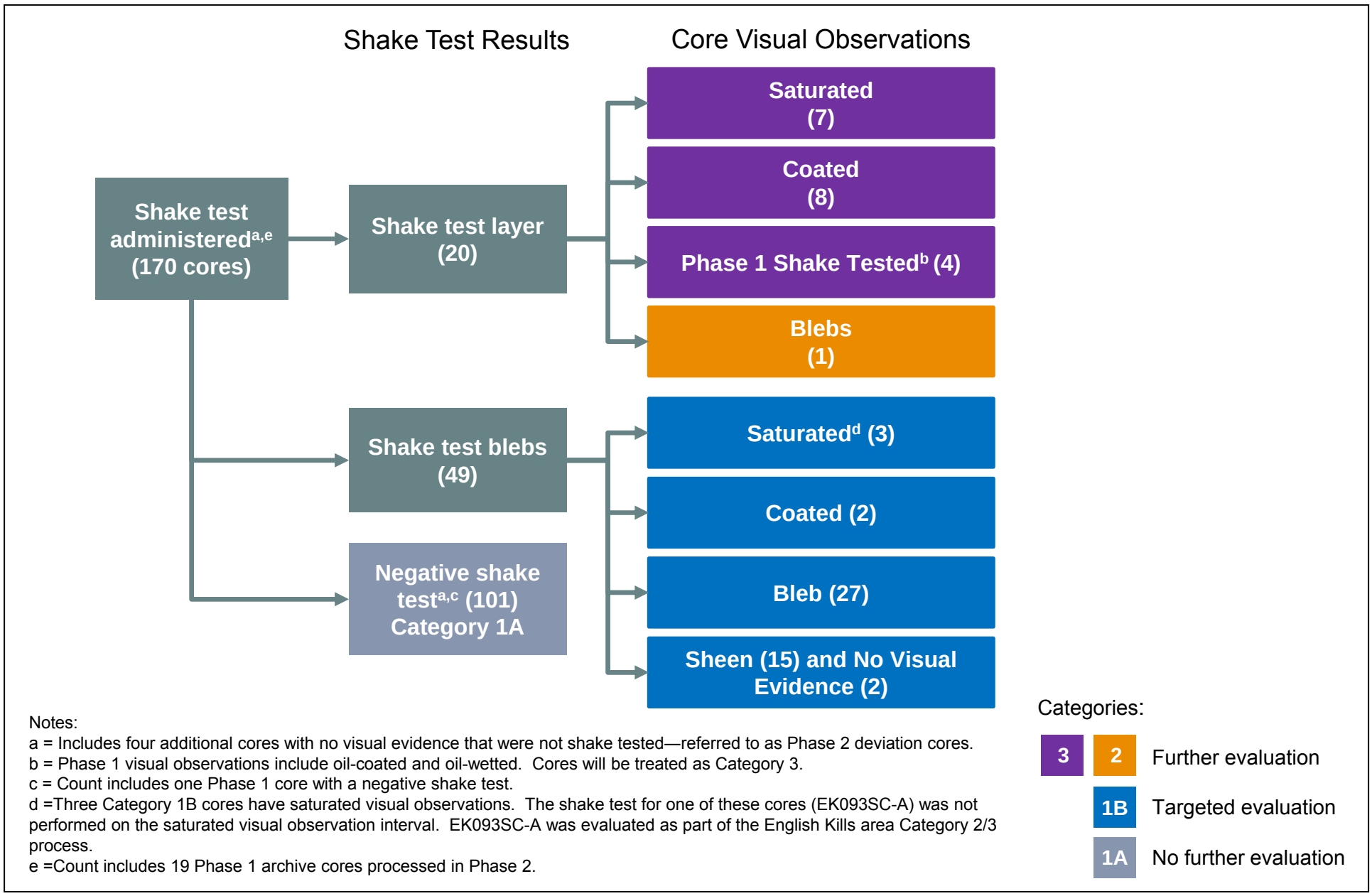
Figure C3-4
Most Notable NAPL Observations in Native Material
NAPL Evaluation
Newtown Creek RI/FS



Notes:
a = Includes four additional cores with no visual evidence that were not shake tested—referred to as Phase 2 deviation cores.
b = Phase 1 visual observations include oil-coated and oil-wetted. Cores will be treated as Category 3.
c = Count includes one Phase 1 core with a negative shake test.
d =Three Category 1B cores have saturated visual observations. The shake test for one of these cores (EK093SC-A) was not performed on the saturated visual observation interval. EK093SC-A was evaluated as part of the English Kills area Category 2/3 process.
e =Count includes 19 Phase 1 archive cores processed in Phase 2.

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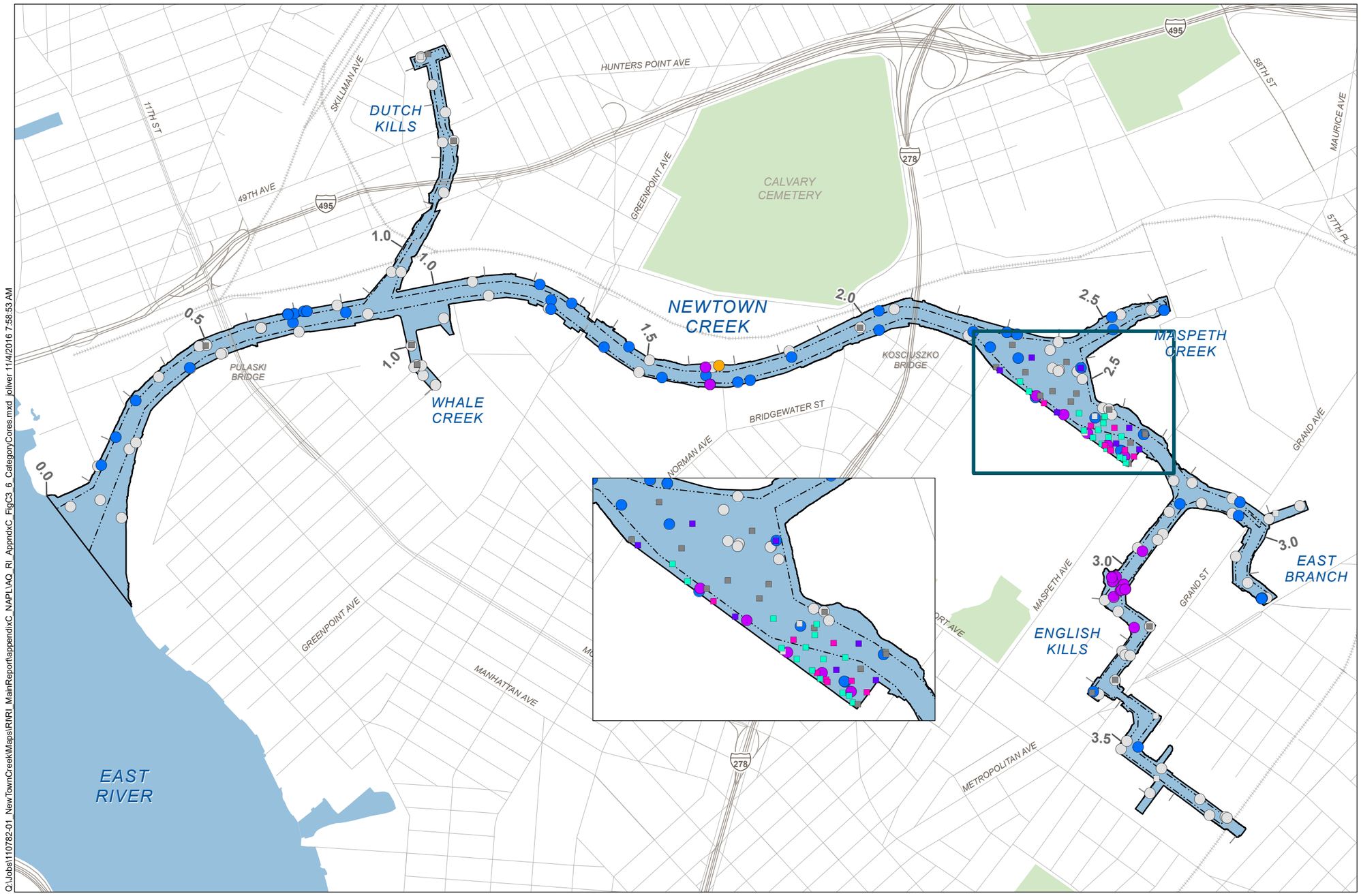
Figure C3-5
Process for Identifying Magnitude of NAPL Observations in Phase 1 and Phase 2 Cores Processed Using Phase 2 Methods
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel

NAPL Category Core Station

Category 1A
Category 1B
Category 2
Category 3

Most Notable NAPL Observation in Core

Visual Observation

Saturated
Coated
Blebs
Sheen
No Visual

Note:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Cores shown were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
3. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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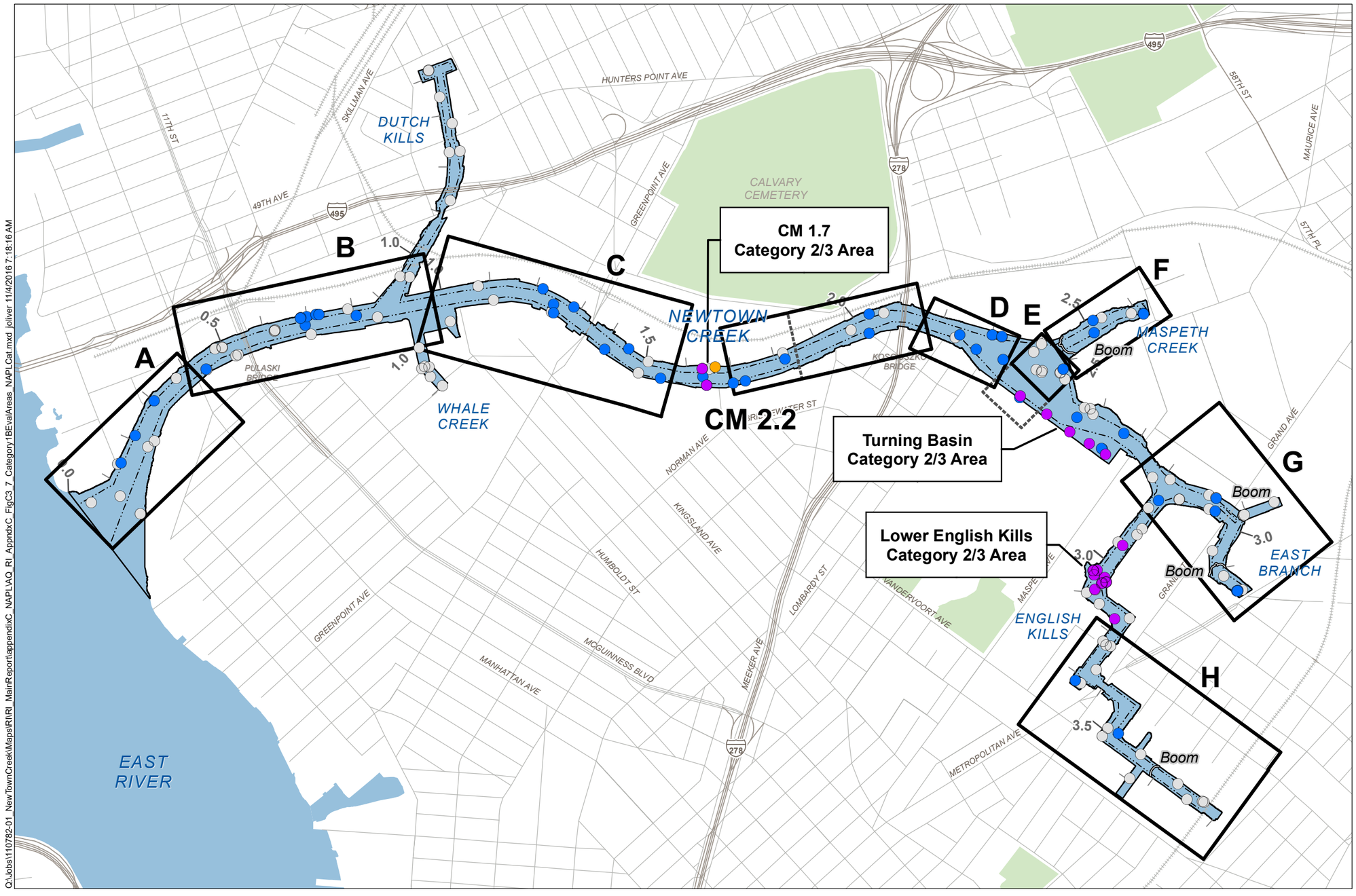
Figure C3-6
NAPL Categories
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel
Boom
Category 1B Evaluation Area
Category 1B Evaluation Area Before Adjustment

NAPL Category Core Station

Category 1A
Category 1B
Category 2
Category 3

Notes:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Category 1B Evaluation Area names (A through H and CM 2.2) are labeled.
3. Category 1B Evaluation Areas CM 2.2 and E were adjusted based on the results of the NAPL Evaluation as described in Appendix C – NAPL Evalution Sections 4.3.3.3 and 4.4.1.2.
4. Cores shown were collected during the Phase 1 and Phase 2 field programs.
5. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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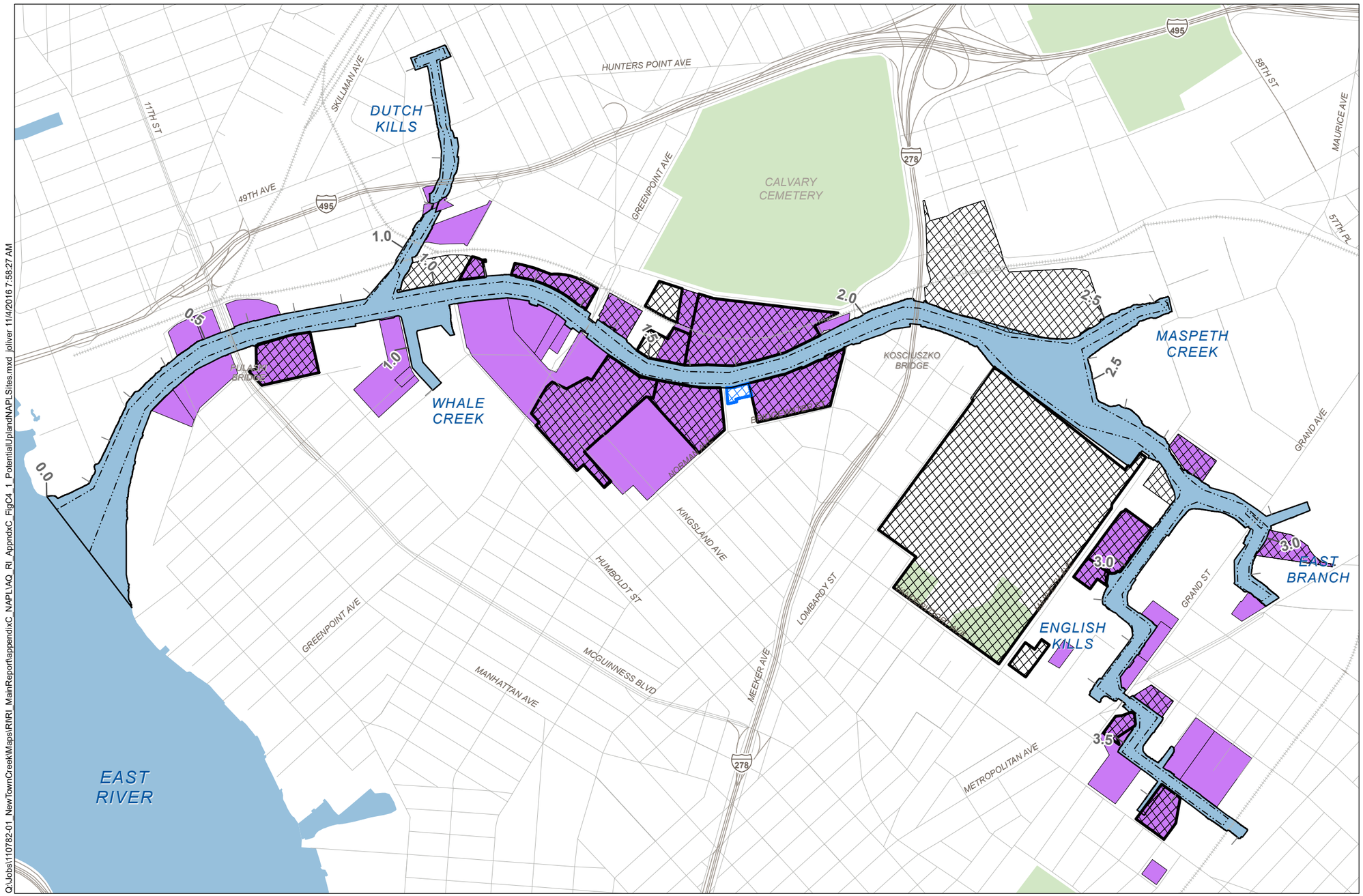
Figure C3-7
NAPL Categories and Evaluation Areas
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel

Potential Upland NAPL Site

2012 DAR
2015 DAR Addendum
USEPA-identified DAR
USEPA-identified Non-DAR

Notes:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. DAR = Data Applicability Report
4. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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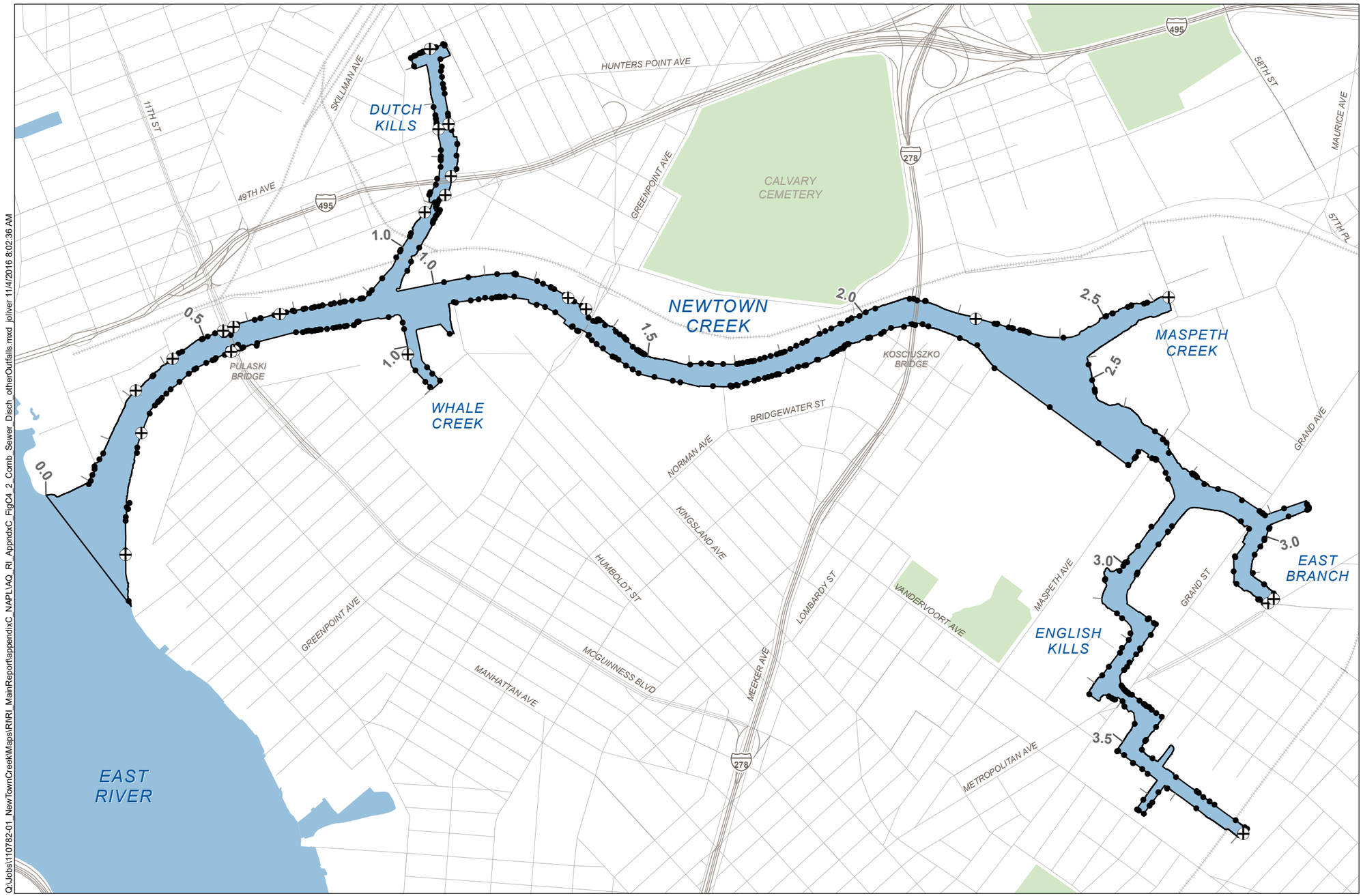
Figure C4-1
Potential Upland NAPL Sites
NAPL Evaluation
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space
Combined Sewer Overflow
Other Outfalls

Notes:
1. Outfall locations are approximate and based on best available information.
2. Additional information about these outfalls is provided in the outfall inventory in Appendix E.
3. Base data acquired from New York City Department of Information Technology and Telecommunications.
4 Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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Figure C4-2
Combined Sewer Overflow and Other Outfalls that Discharge to the Study Area
NAPL Evaluation
Newtown Creek RI/FS

Newtown Creek Study Area
Navigation Channel
Creek Mile
Evaluation Area Boundary
Combined Sewer Overflow
Other Outfalls

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Visual and shake test NAPL observations represent the most notable observations from entire core.
3. Cores shown were collected during the Phase 1 and Phase 2 field programs.
4. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 80 160 240 320

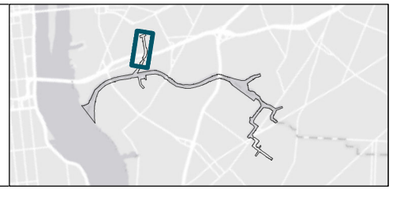

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Figure C4-3
Dutch Kills NAPL Observations
NAPL Evaluation
Newtown Creek RI/FS

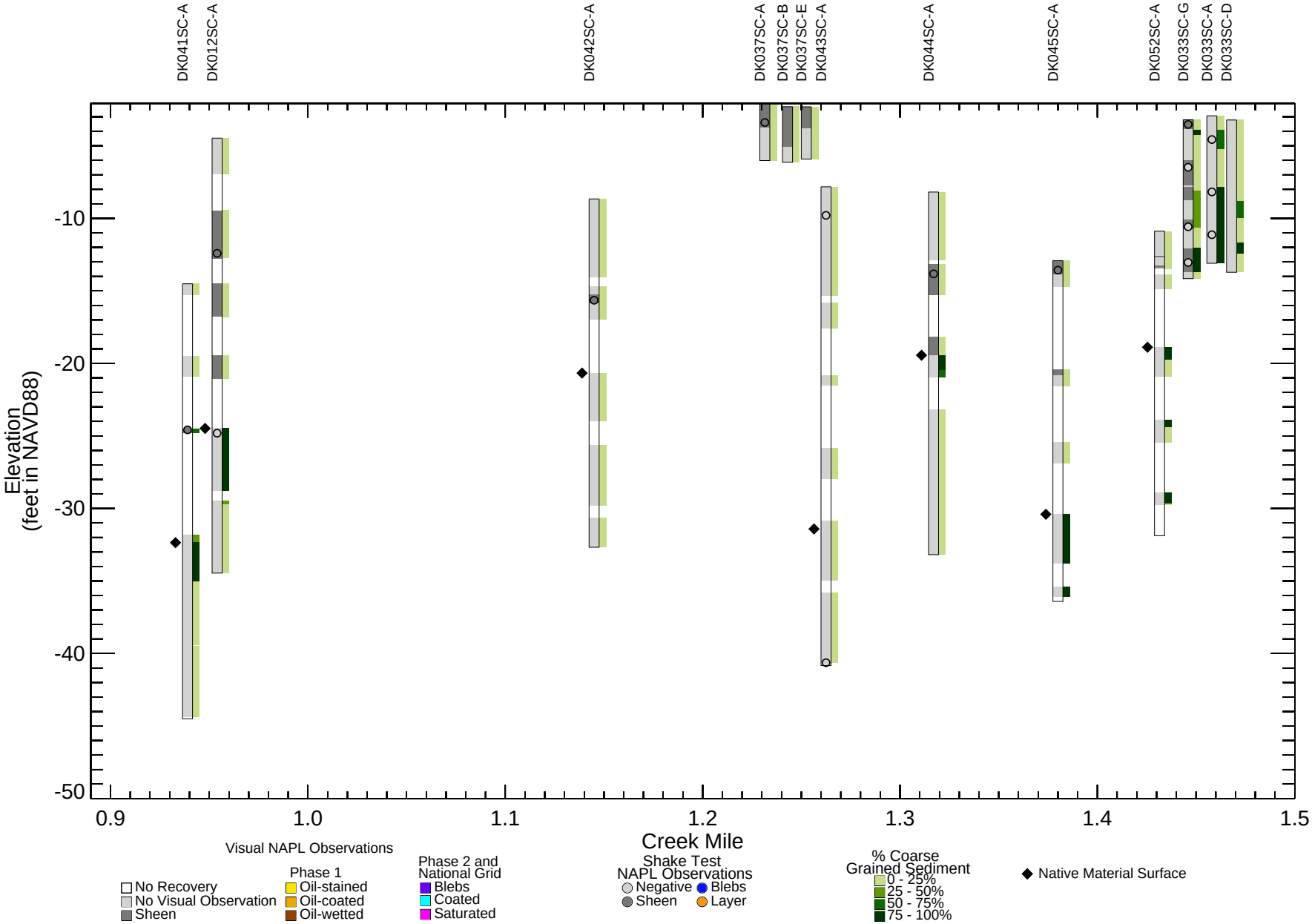

Figure C4-4
Dutch Kills Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Note: Shake test results include Phase 1 shake-tested cores.

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Newtown Creek Study Area
Navigation Channel
Creek Mile
Evaluation Area Boundary
Combined Sewer Overflow
Other Outfalls

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Visual and shake test NAPL observations represent the most notable observations from entire core.
3. Cores shown were collected during the Phase 1 and Phase 2 field programs.
4. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 50 100 150 200

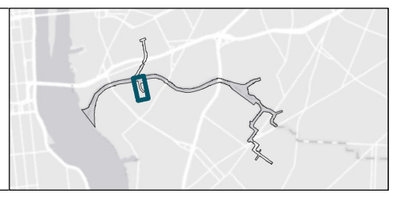

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Figure C4-5
Whale Creek NAPL Observations
NAPL Evaluation
Newtown Creek RI/FS

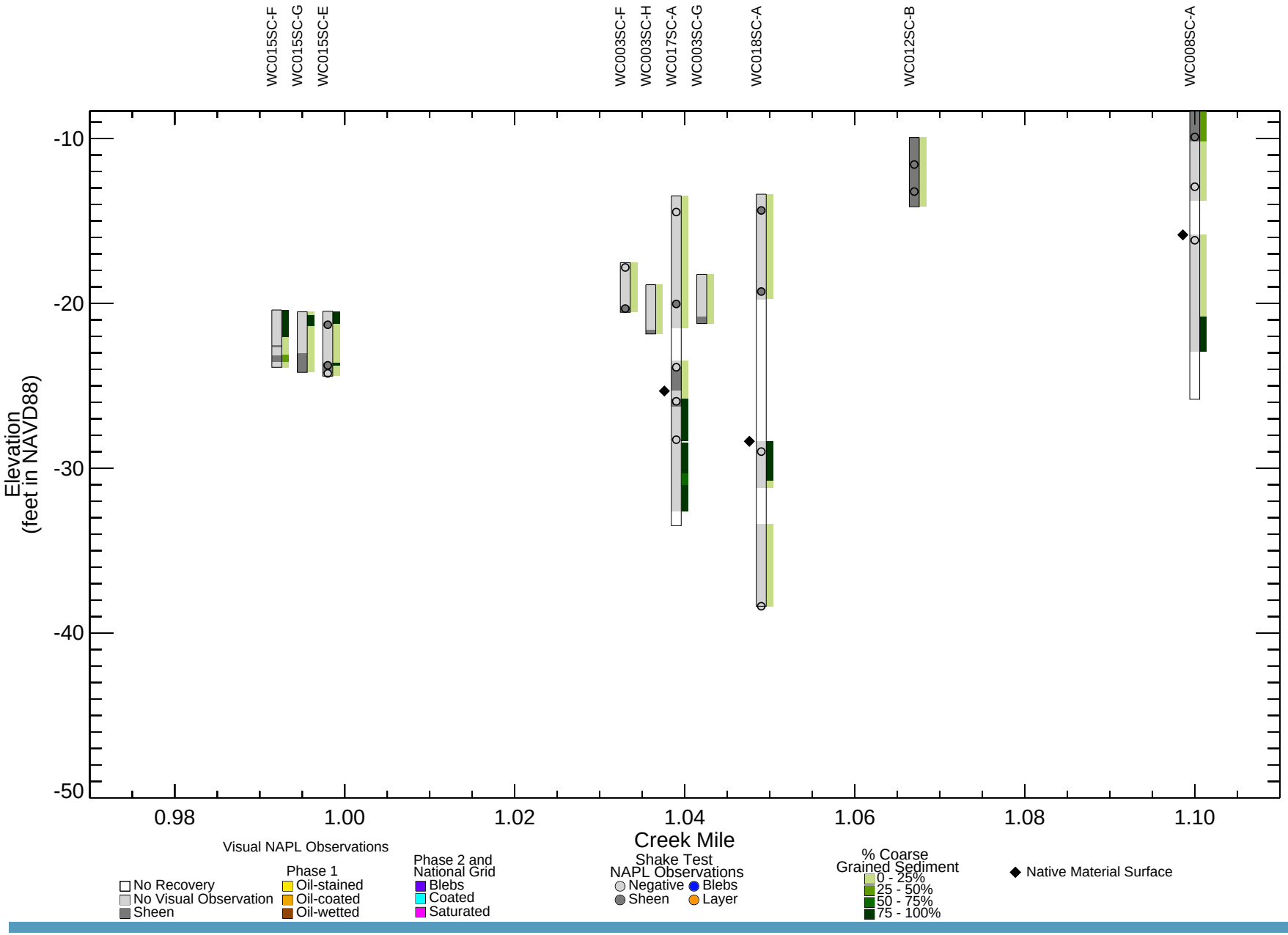
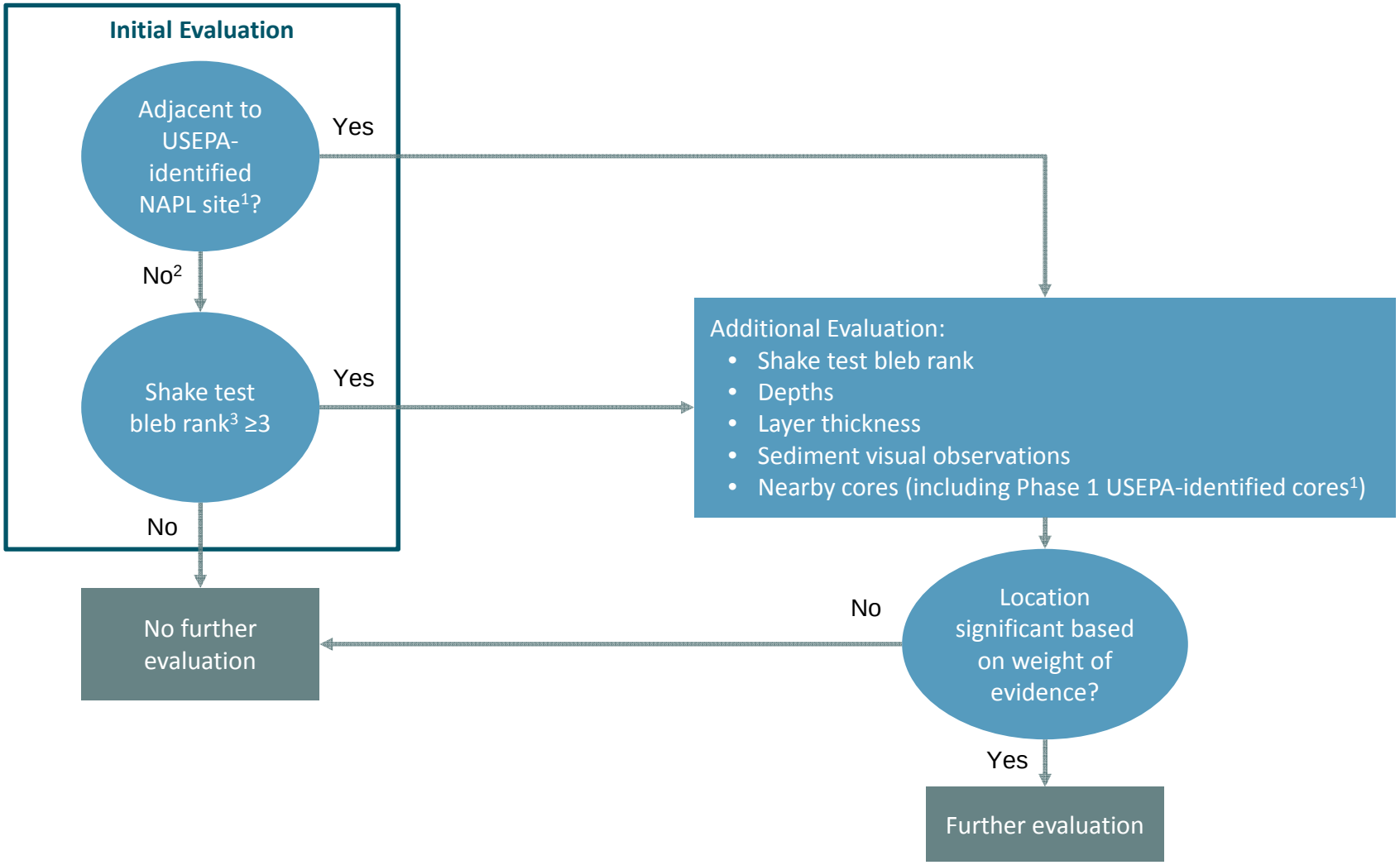


Figure C4-6
Whale Creek Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

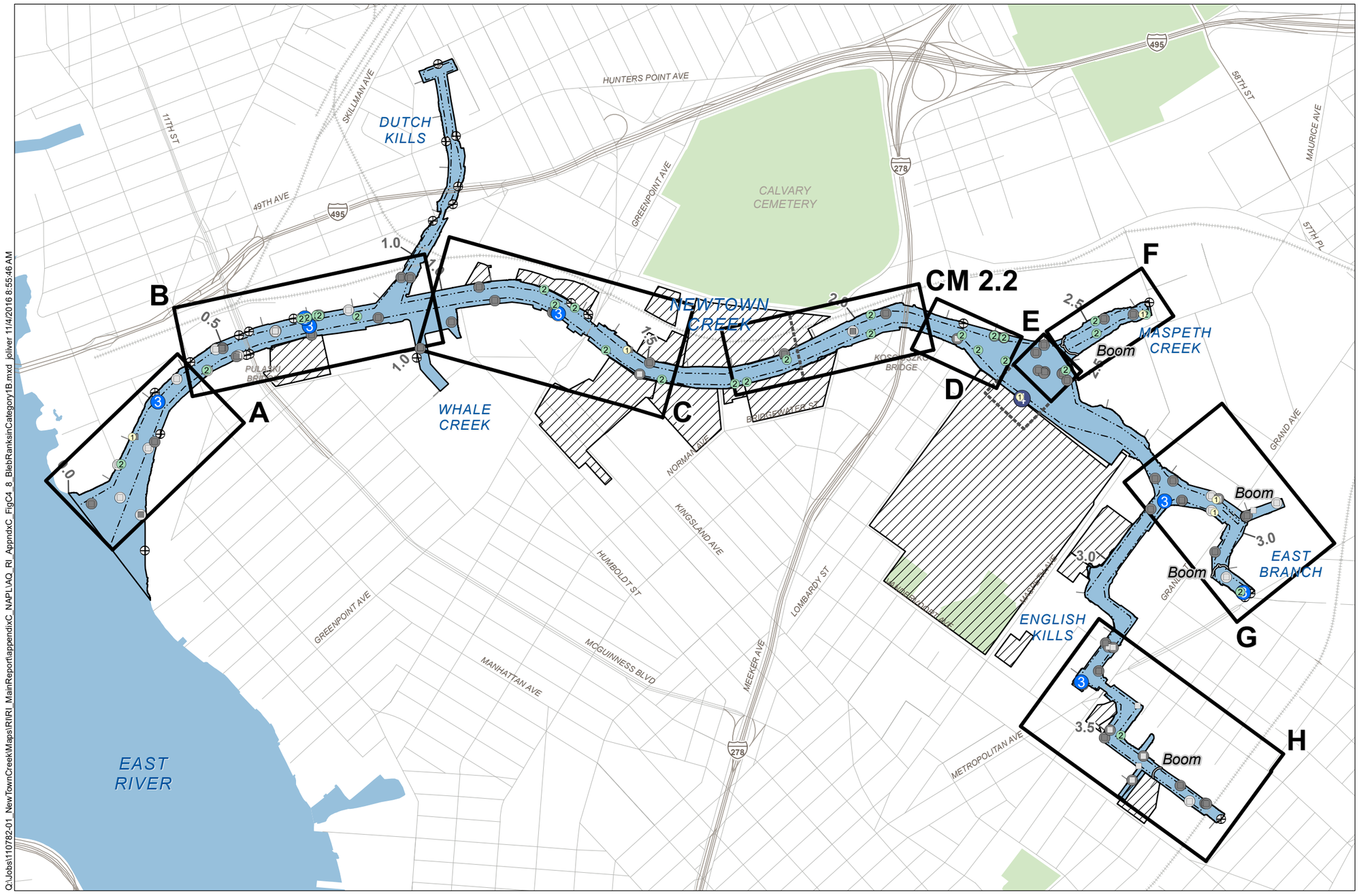
Note: Shake test results include Phase 1 shake-tested cores.

ANCHOR QEA



Notes:
1 = Per correspondence between Caroline Kwan and Jim Quadrini on April 2, 2014 (Kwan 2014b), and subsequent feedback from USEPA.
2 = If not adjacent to a USEPA-identified NAPL site, the USEPA-identified cores will be used as additional information to delineate Phase 2 cores.
3 = Each core represented by the maximum shake test bleb rank.

Figure C4-7
Process for Evaluating Category 1B and Phase 1 USEPA-Identified Cores
NAPL Evaluation
Newtown Creek RI/FS



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- Newtown Creek Study Area
- Waterbody
- Open Space
- Navigation Channel
- Boom
- Combined Sewer Outfall
- USEPA-identified Upland NAPL Site
- Category 1B Evaluation
- Category 1B Evaluation Area Before Adjustment

Category 1B Bleb Rank Core Station

- Rank 1
- Rank 2
- Rank 3
- Rank 4

Most Notable NAPL Observation in Core

Visual Observation

- Sheen
- No Visual Observation

Shake Test

- Sheen
- Negative

Notes:
1. Base data acquired from New York City Department of Information Technology and Telecommunications.
2. USEPA-identified NAPL sites identified through correspondence between Caroline Kwan and Jim Quadrini on April 2, 2014 (Kwan 2014b) and subsequent feedback from USEPA.
3. Category 1B Evaluation Area names (A through H and CM 2.2) are labeled.
4. Cores shown were collected during the Phase 1 and Phase 2 field programs.
5. Category 1B Evaluation Areas CM 2.2 and E were adjusted based on the results of the NAPL Evaluation as described in Appendix C – NAPL Evalution Sections 4.3.3.3 and 4.4.1.2.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

0 500 1,000 1,500 Feet

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Figure C4-8
Shake Test Bleb Ranks in Category 1B Areas
NAPL Evaluation
Newtown Creek RI/FS

Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 80 160 240 320

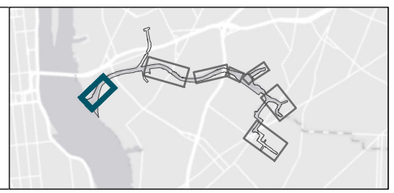

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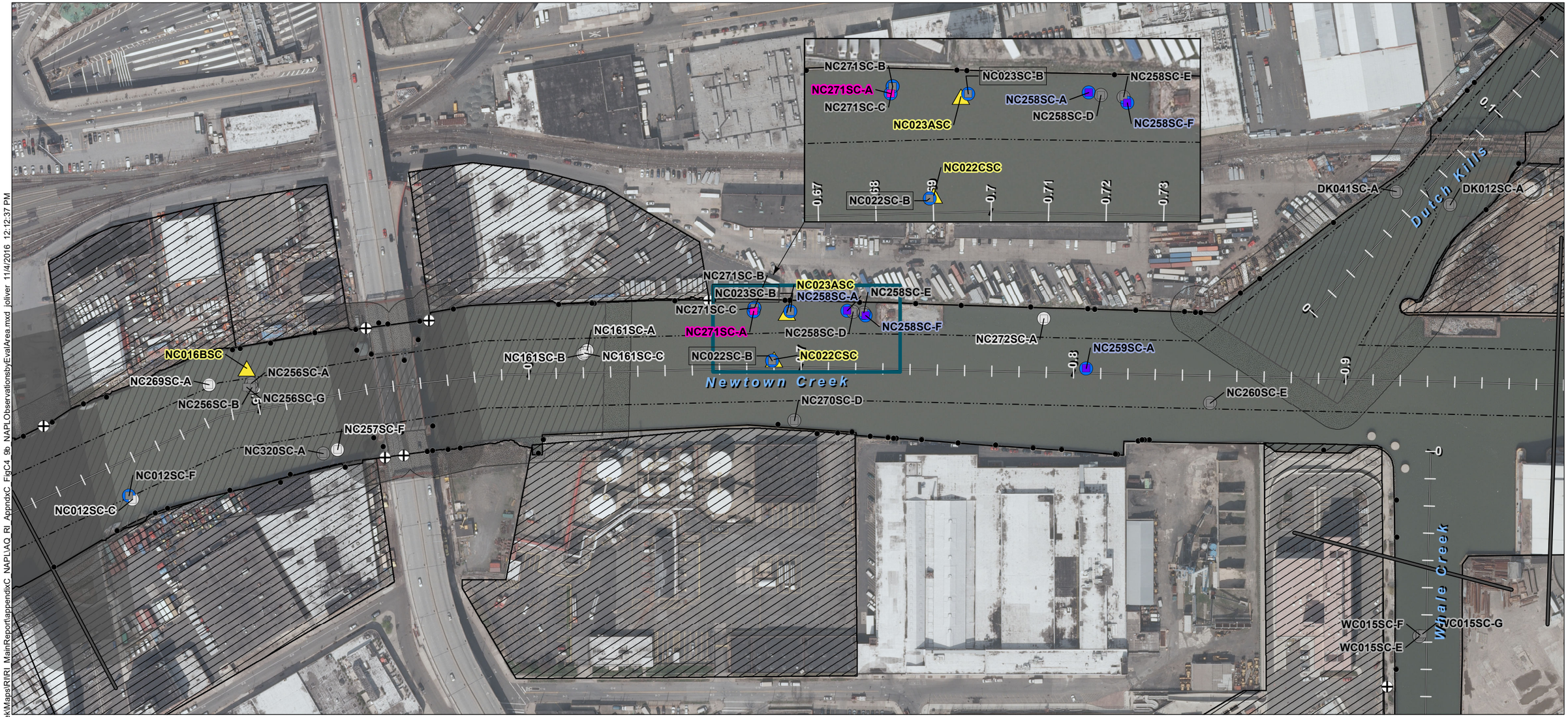
Figure C4-9a
Category 1B Area A
NAPL Evaluation
Newtown Creek RI/FS



Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

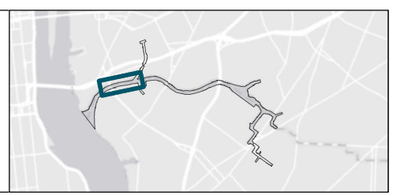
Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 100 200 300 400



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ANCHOR QEA

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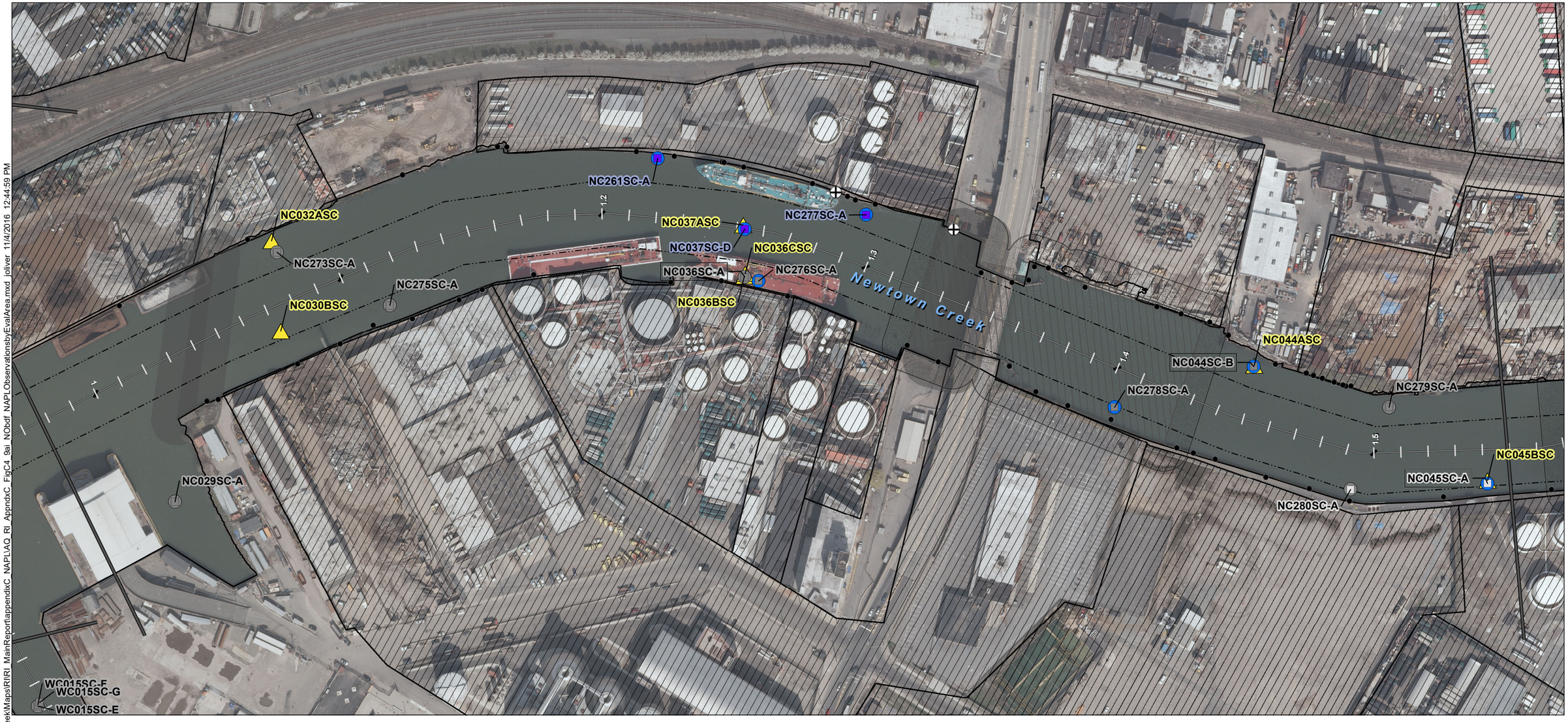
Figure C4-9b
Category 1B Area B
NAPL Evaluation
Newtown Creek RI/FS



Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 100 200 300 400

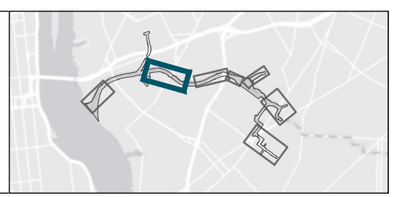


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Figure C4-9c
Category 1B Area C
NAPL Evaluation
Newtown Creek RI/FS

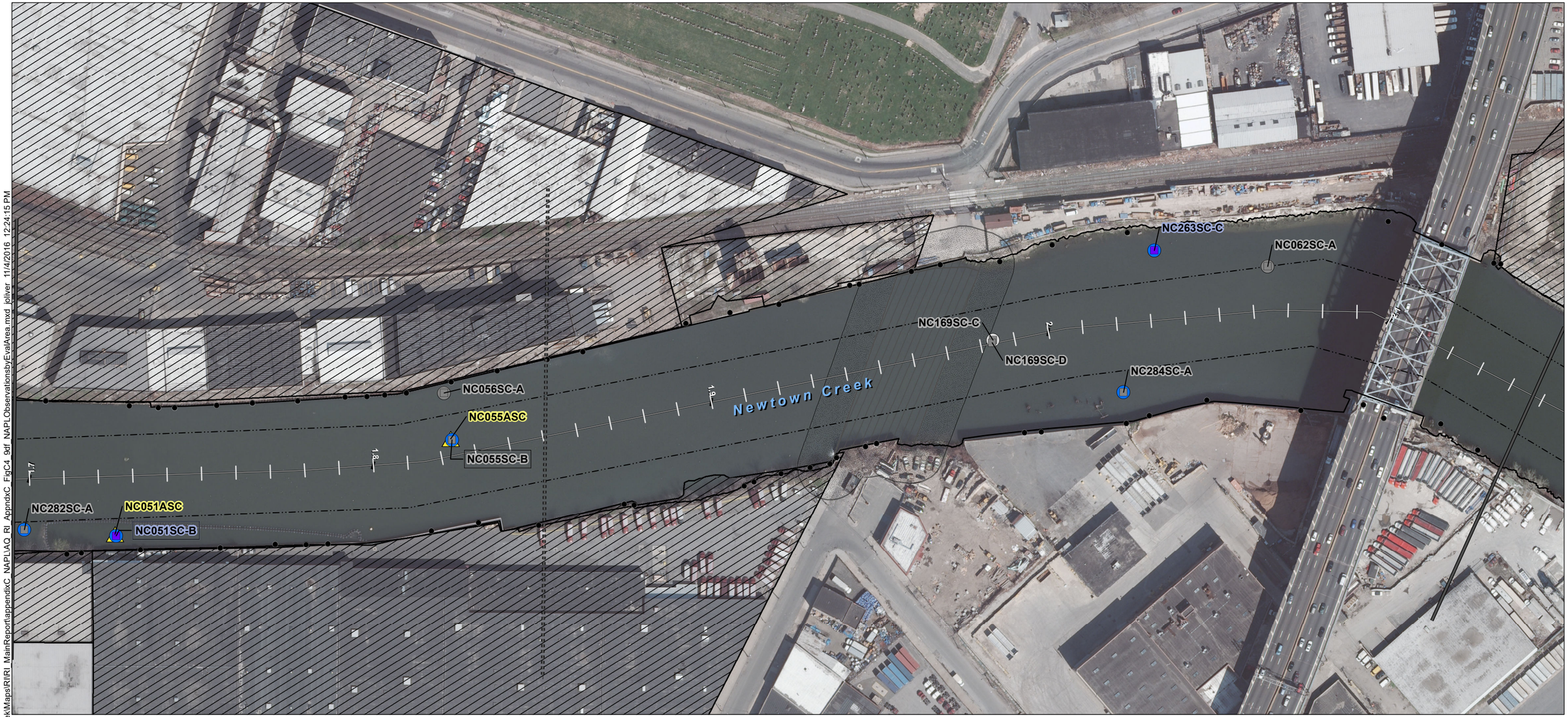

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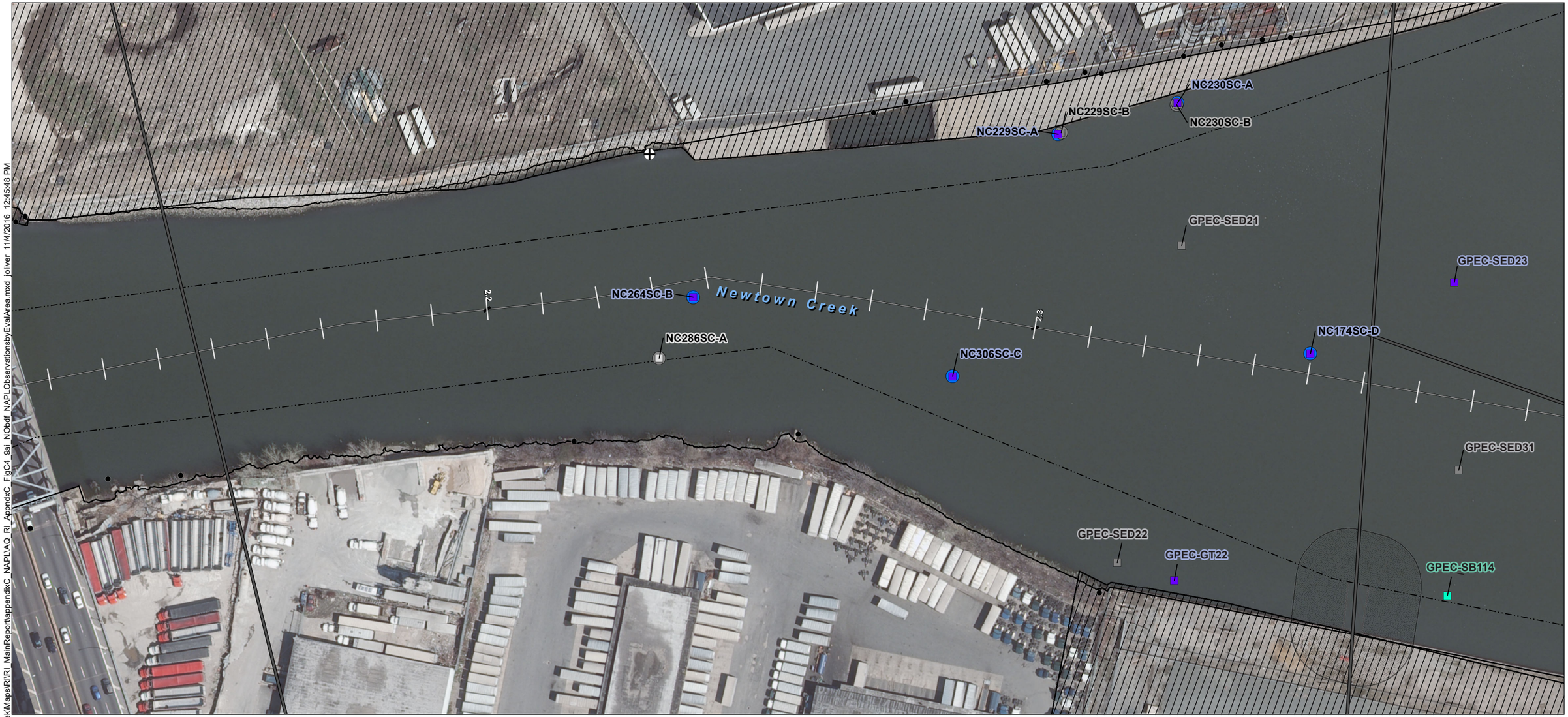
Figure C4-9d
Category 1B Area CM 2.2
NAPL Evaluation
Newtown Creek RI/FS



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Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 40 80 120 160

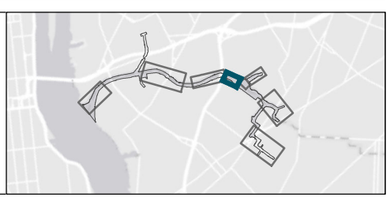

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Figure C4-9e
Category 1B Area D
NAPL Evaluation
Newtown Creek RI/FS

Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Evaluation Area Boundary Before Adjustment
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

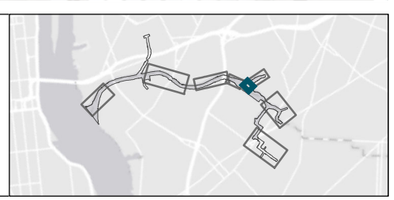
Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Category 1B Evaluation Areas CM 2.2 and E were adjusted based on the results of the NAPL Evaluation as described in Appendix C – NAPL Evaluation Sections 4.3.3.3 and 4.4.1.2.
7. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 40 80 120 160



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ANCHOR QEA

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Figure C4-9f
Category 1B Area E
NAPL Evaluation
Newtown Creek RI/FS

Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 40 80 120 160

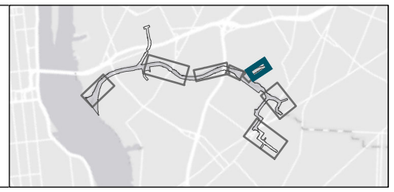

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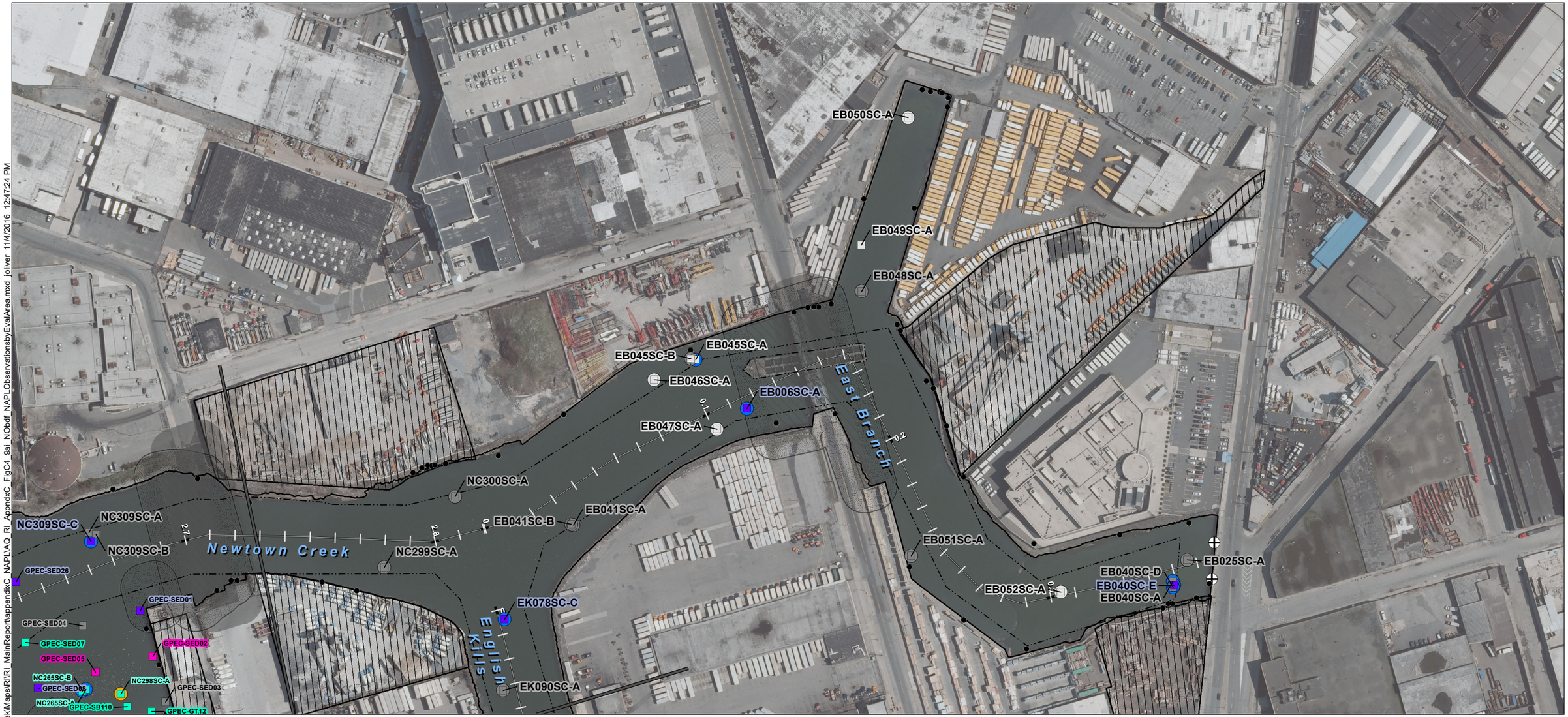
Figure C4-9g
Category 1B Area F
NAPL Evaluation
Newtown Creek RI/FS



Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 100 200 300 400

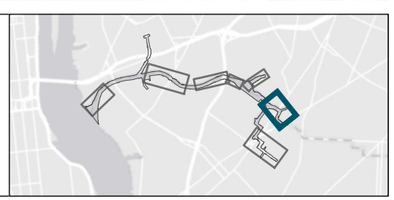


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Figure C4-9h
Category 1B Area G
NAPL Evaluation
Newtown Creek RI/FS

Upland Site of Potential Interest[2]
Newtown Creek Study Area
Navigation Channel
Evaluation Area Boundary
Creek Miles

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
NOAA (50 feet)
FOIA (50 feet)

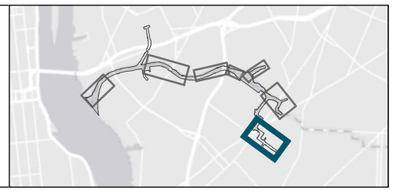
Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Shake Test
Layer
Blebs
Sheen
Negative

Phase 1 USEPA-identified NAPL Core
Combined Sewer Overflow
Outfall

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
6. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 110 220 330 440



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ANCHOR QEA

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Figure C4-9i
Category 1B Area H
NAPL Evaluation
Newtown Creek RI/FS

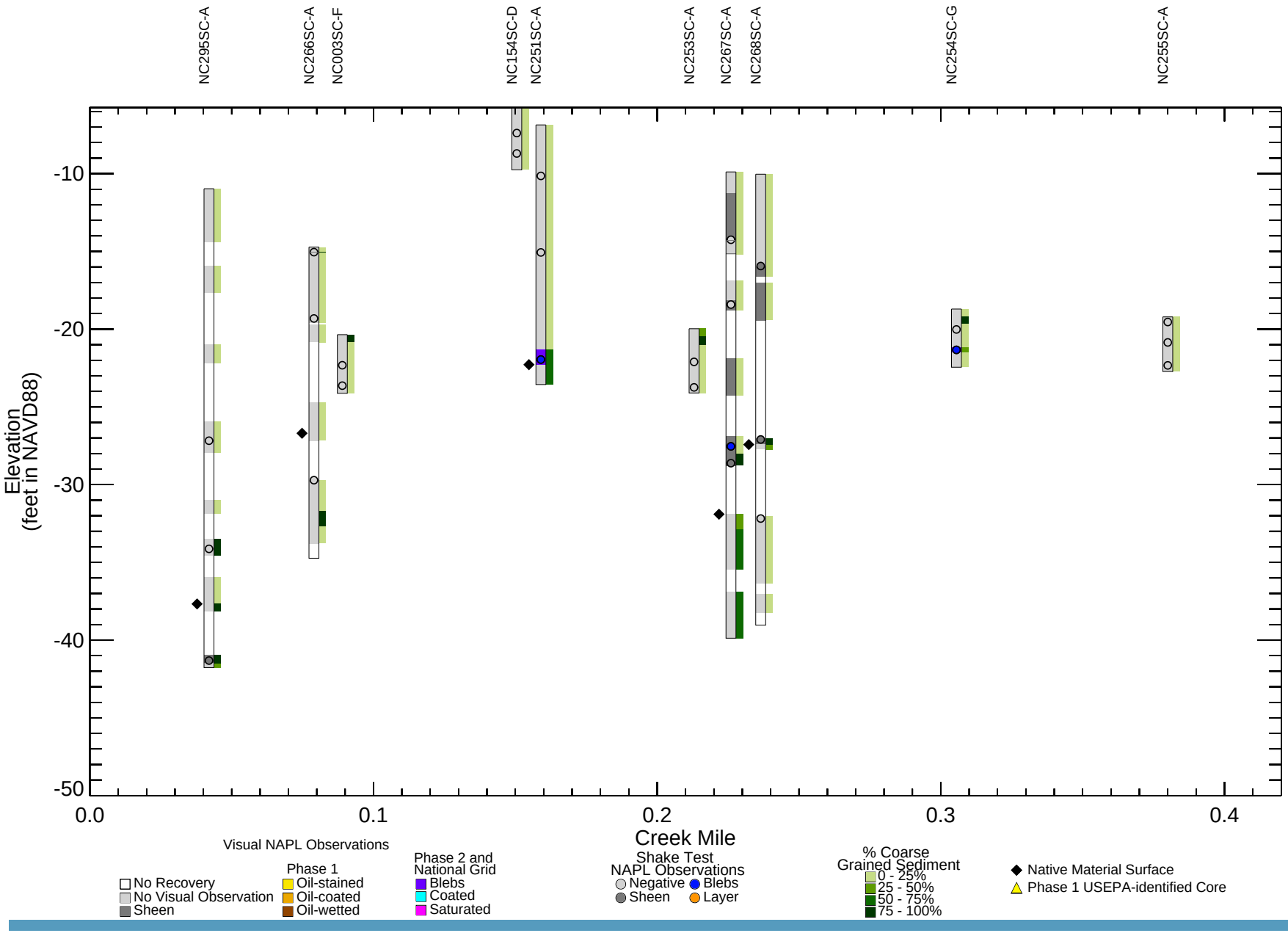


Figure C4-10a
Category 1B Area A Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

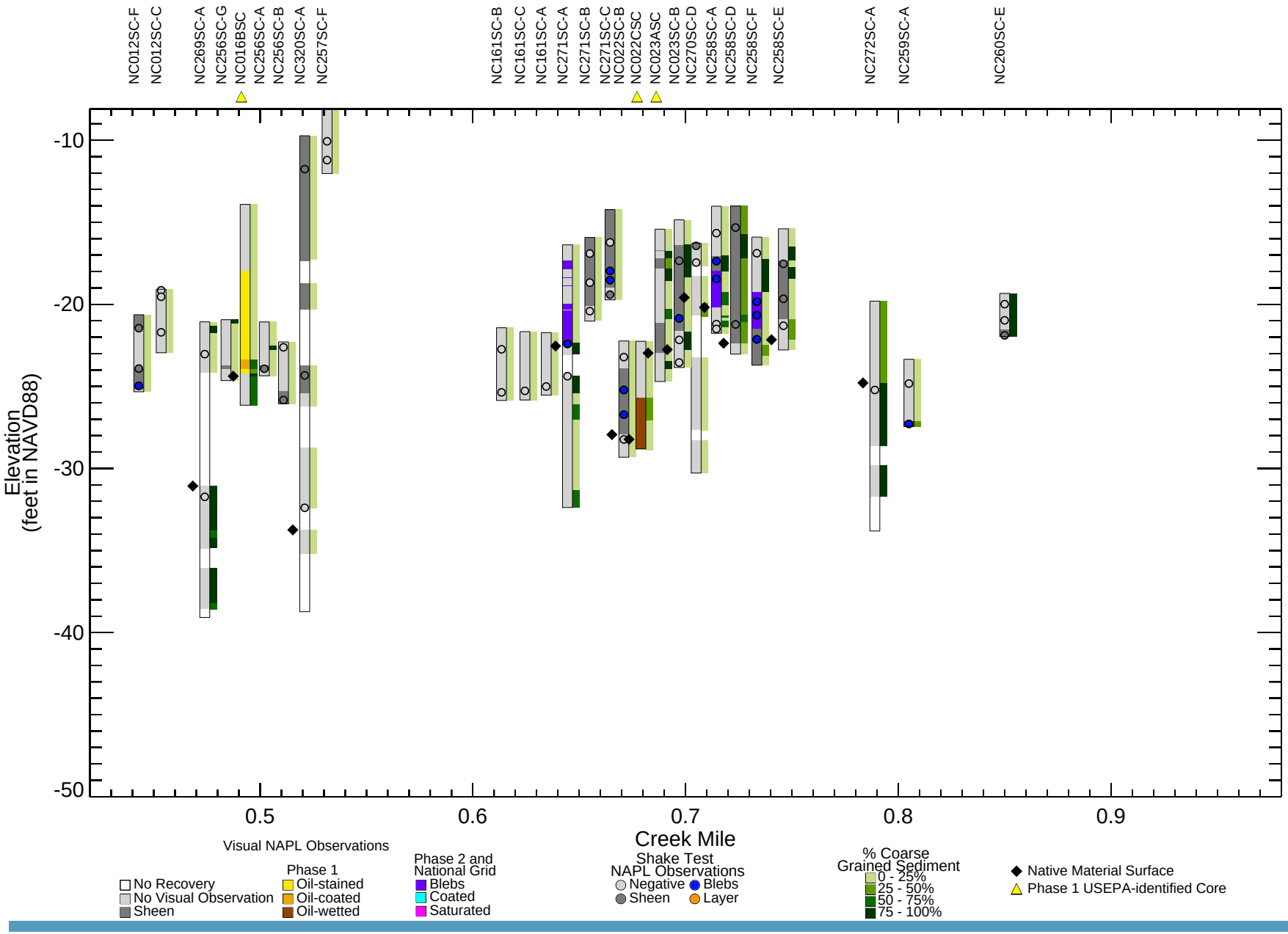


Figure C4-10b

Category 1B Area B Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

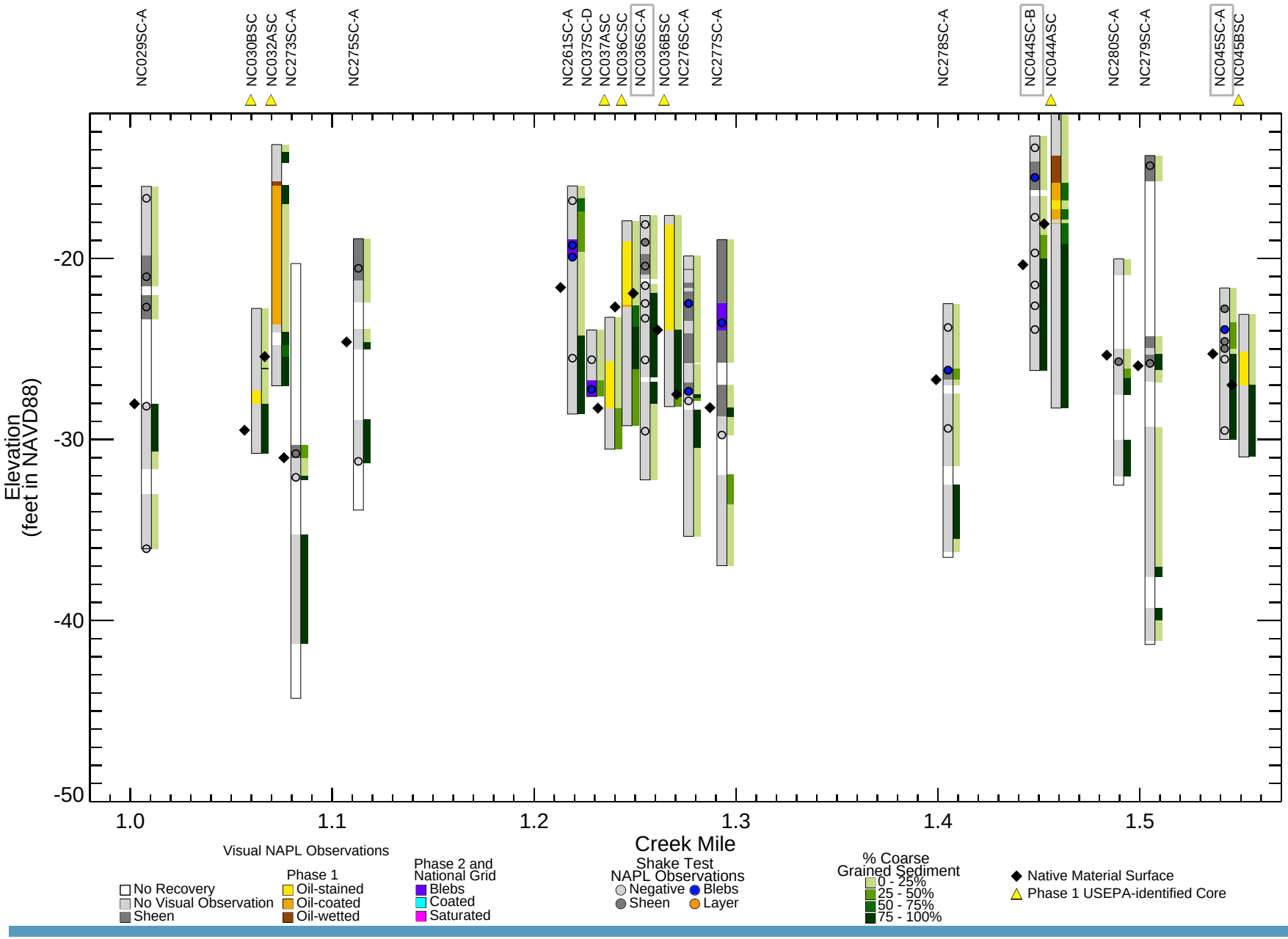


Figure C4-10c

Category 1B Area C Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

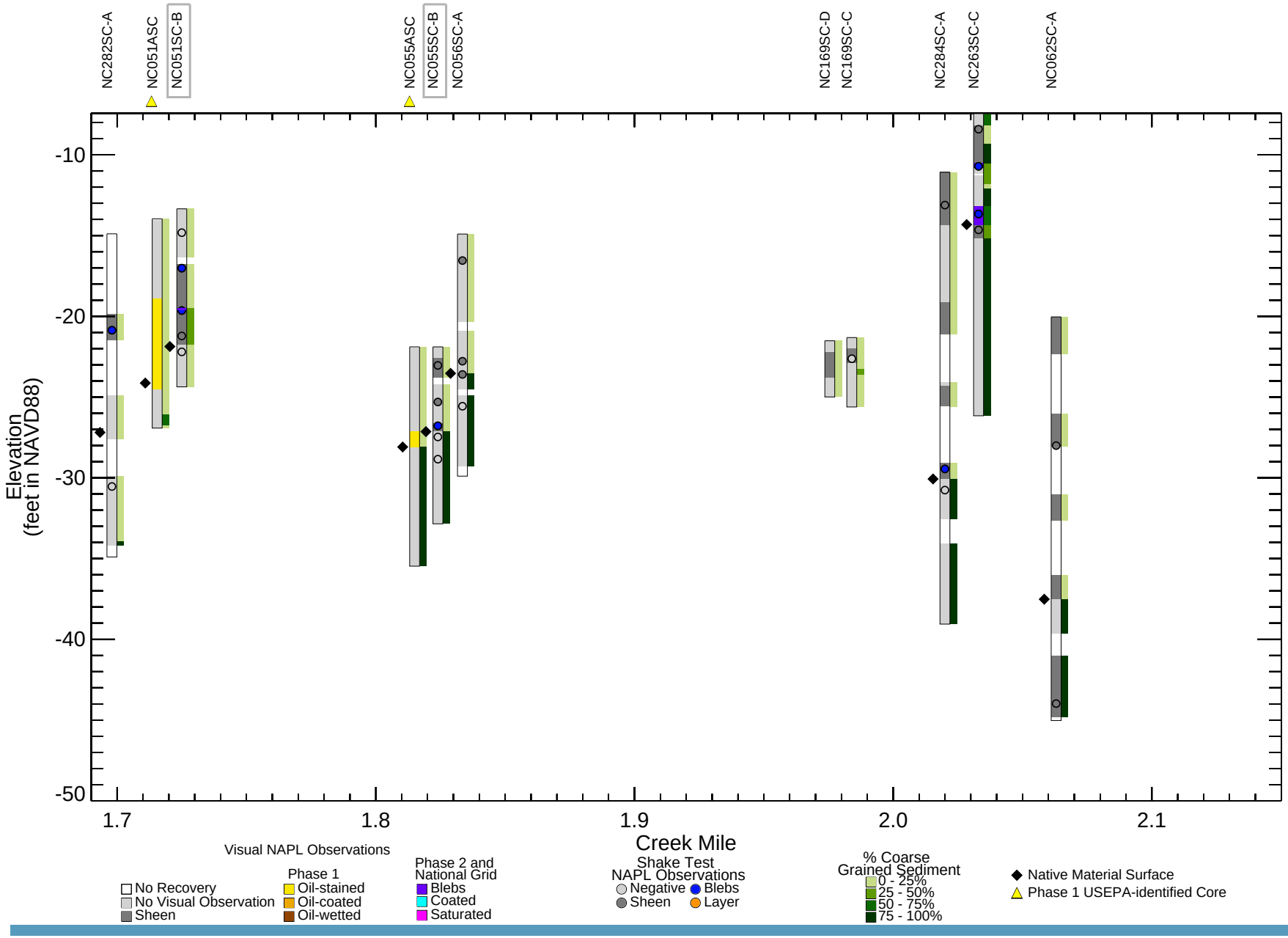


Figure C4-10d

Category 1B Area CM 2.2 Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

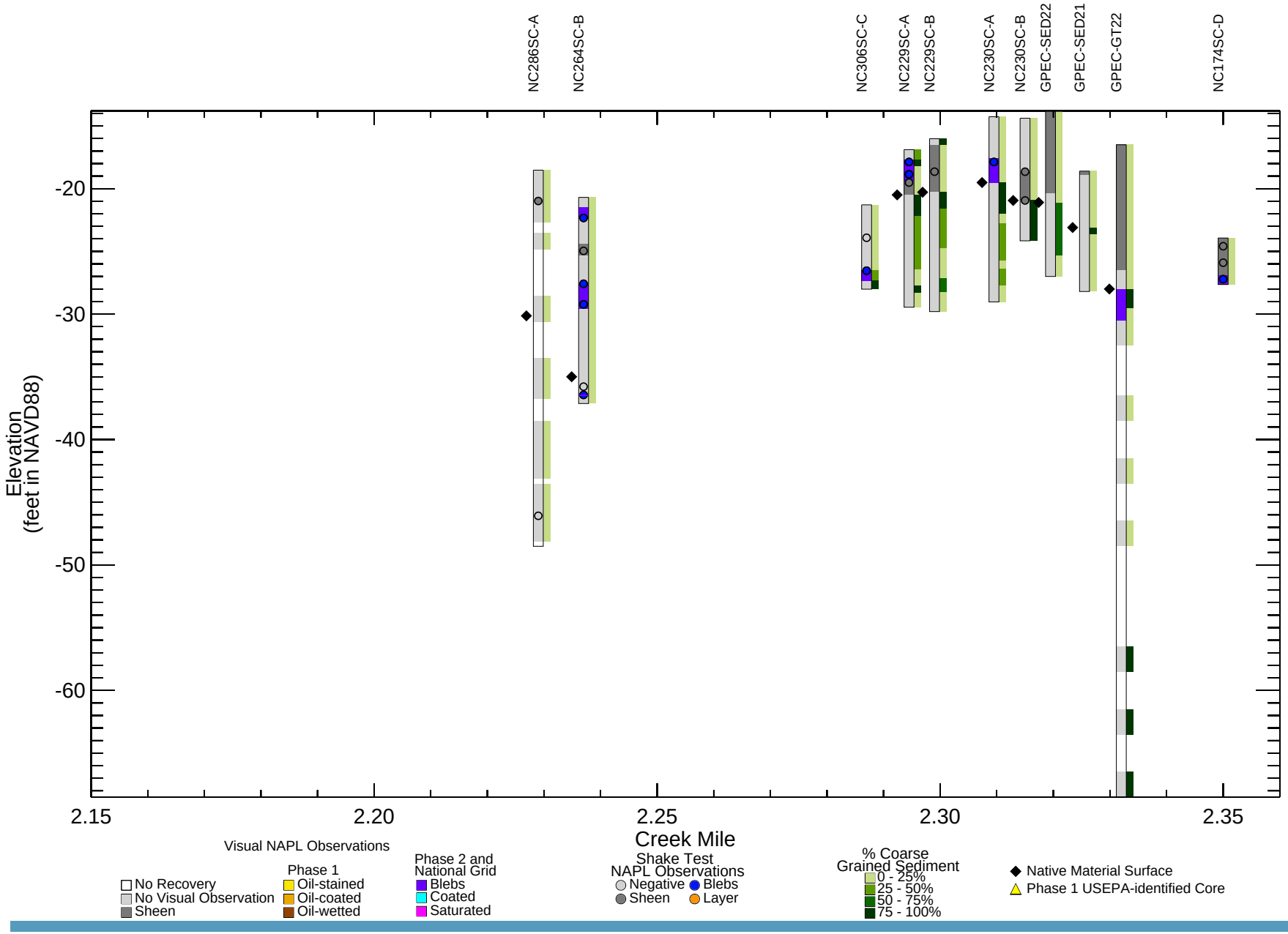


Figure C4-10e

Category 1B Area D Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

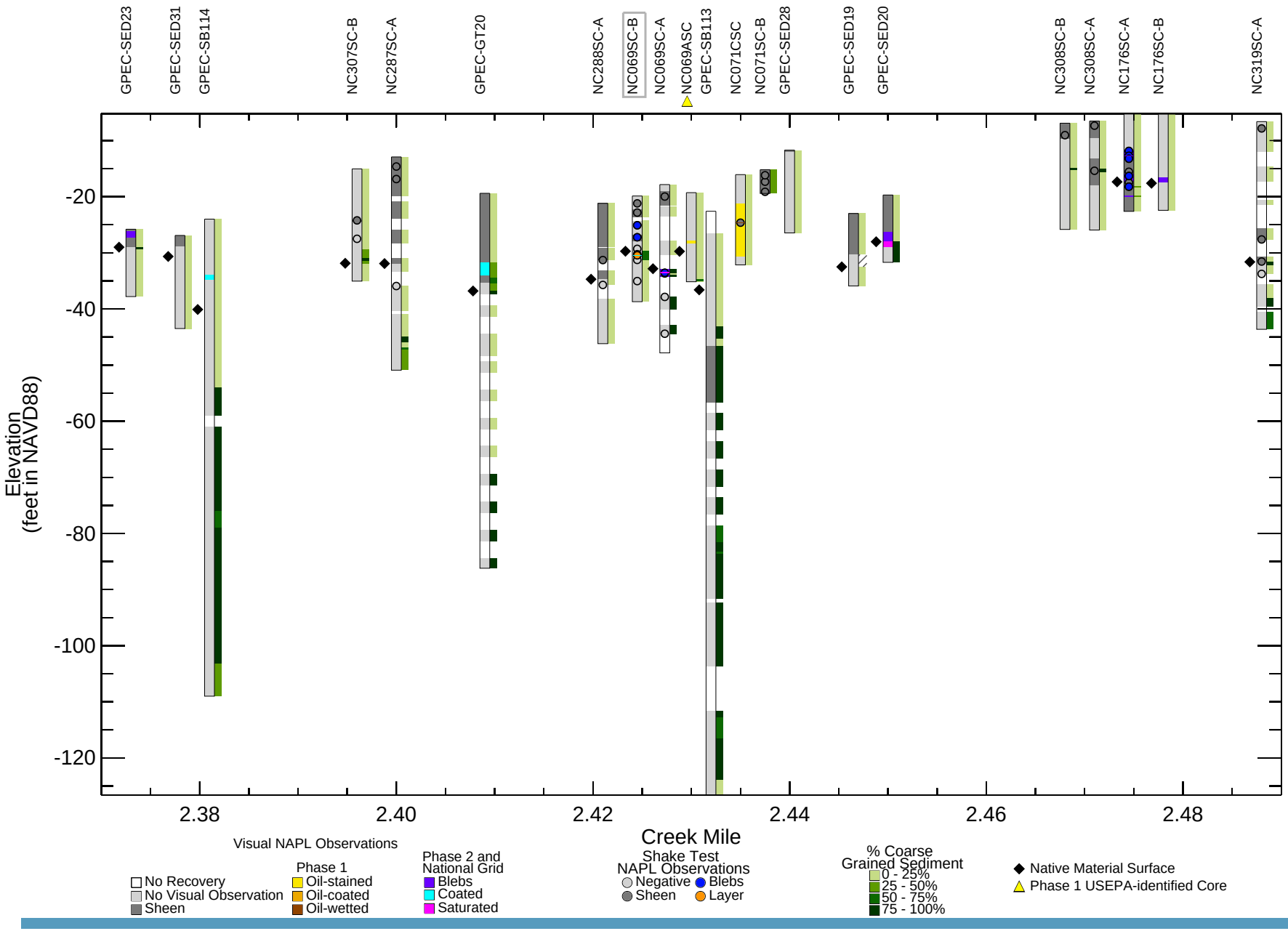


Figure C4-10f

Category 1B Area E Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

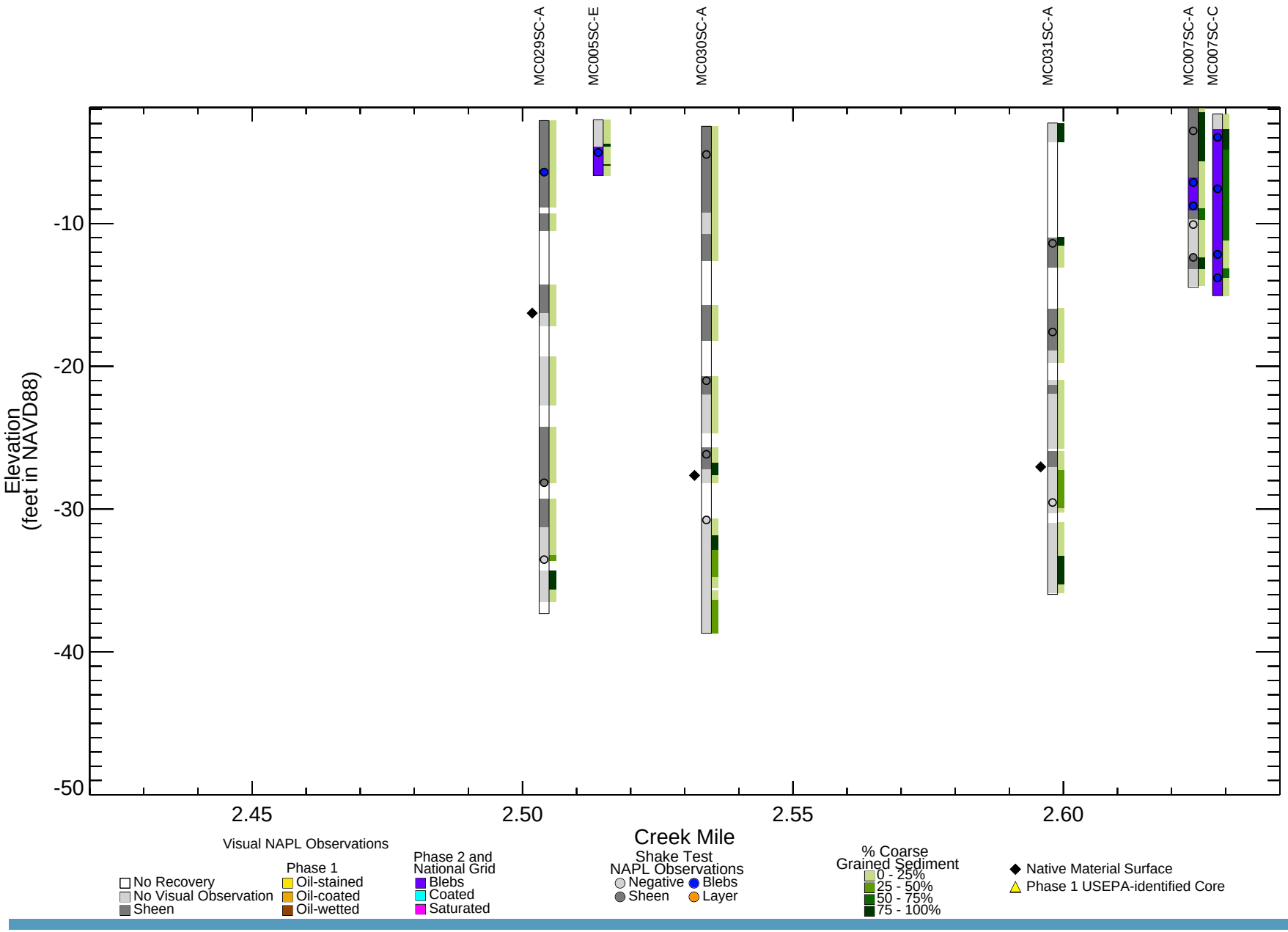


Figure C4-10g

Category 1B Area F Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

CO - C:\D_Drive\Projects\Newtown_Creek\Analysis\NAPL\Documents\RI_Report\NAPL_Draft\02 Figures\IDL\Depth_profiles\NAPL_Profile_by_rmile_with_analytical_lithology_Visualization_1panel_cat1B.pro Wed Nov 02 15:21:58 2016

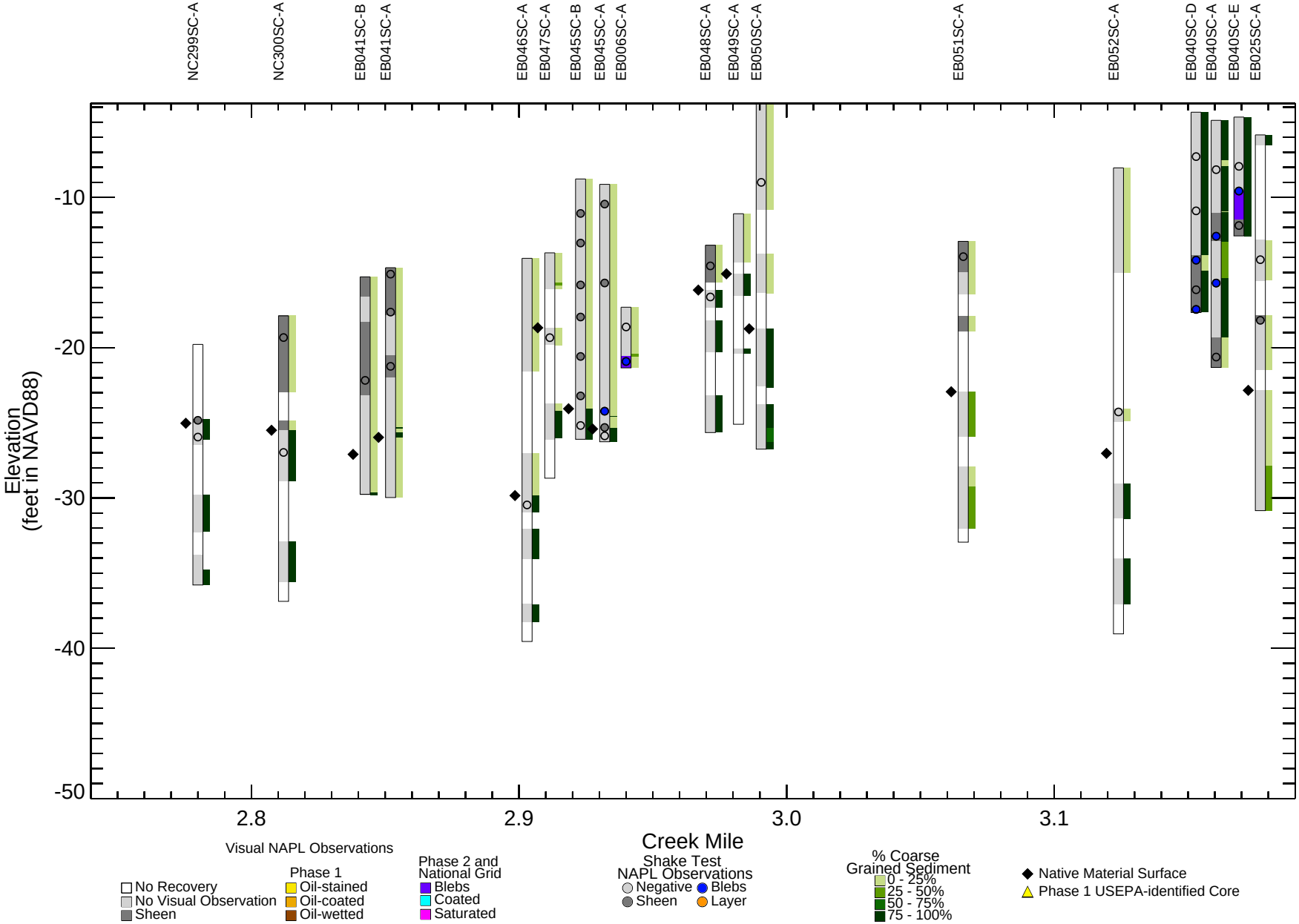


Figure C4-10h

Category 1B Area G Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

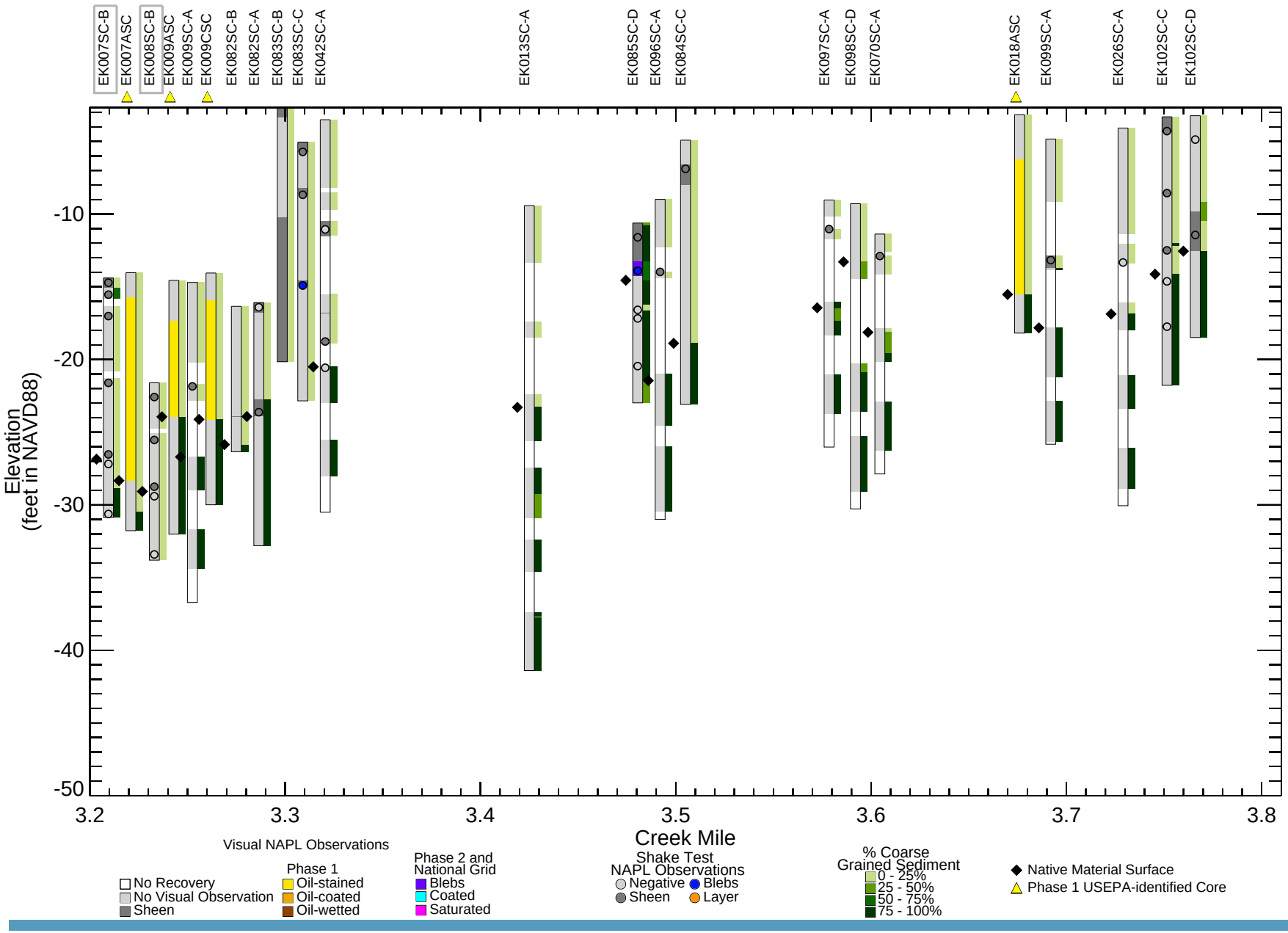
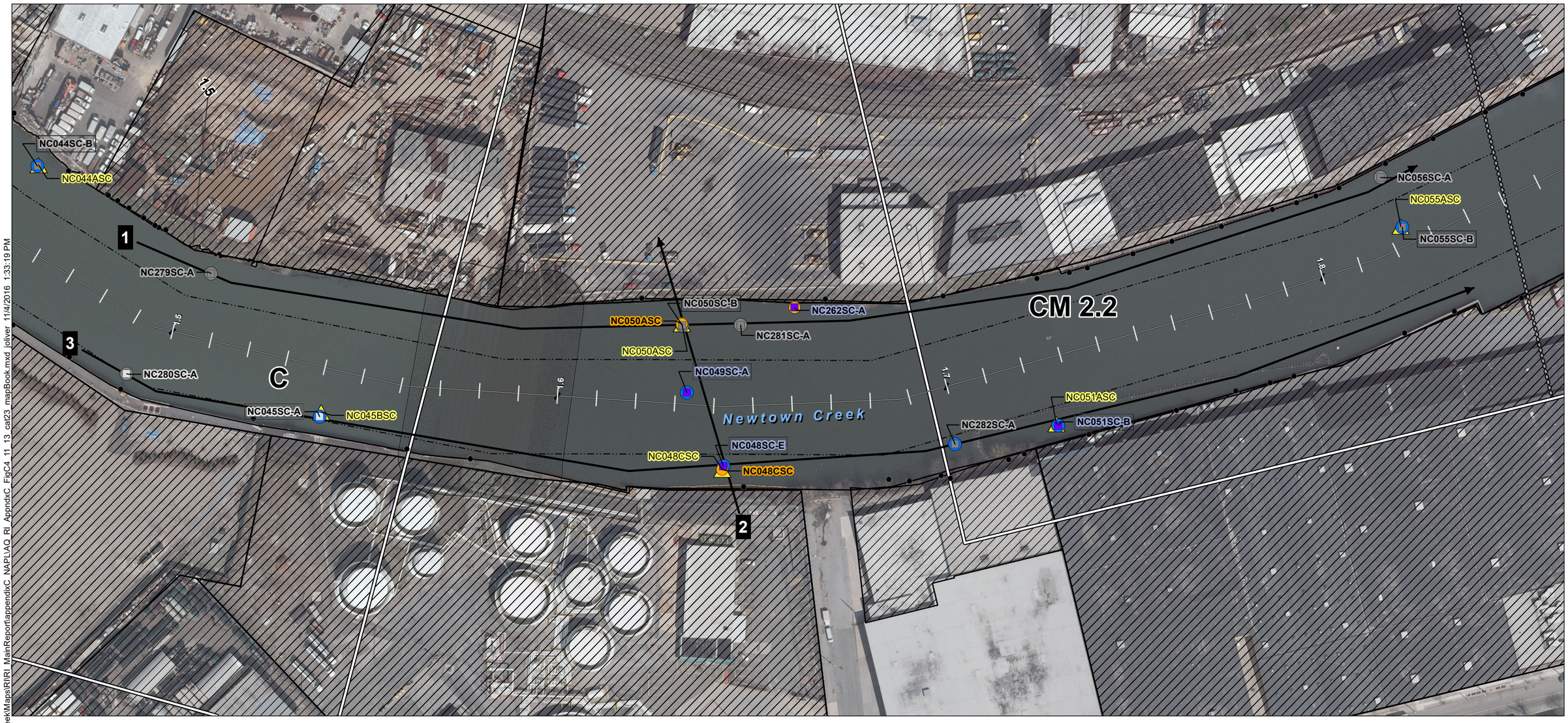


Figure C4-10i

Category 1B Area H Depth Profile
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores.
Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.



Upland Site of Potential Interest
Newtown Creek Study Area
Navigation Channel
Boom
Combined Sewer Overflow
Outfall

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
FOIA (50 feet)
NOAA (50 feet)

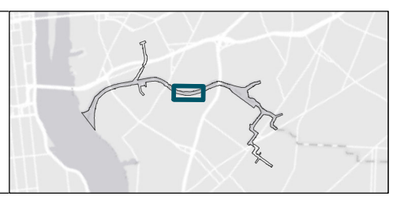
Shake Test
Layer
Blebs
Sheen
Negative

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Phase 1 USEPA-identified NAPL Core
Category 1B Evaluation Area
Category 1B Evaluation Area Before Adjustment
Cross-section
Creek Miles

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Category 1B Evaluation Area names (C, CM 2.2, D, E, F, G and H) are labeled when shown.
6. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
7. Category 1B Evaluation Areas CM 2.2 and E were adjusted based on the results of the NAPL Evaluation as described in Appendix C – NAPL Evalution Sections 4.3.3.3 and 4.4.1.2.
8. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 60 120 180 240



Q:\Jobs\110782-01_NewTownCreek\Maps\RI\RI_MainReport\appendixC_NAPL\AQ_RI_AppndxC_FigC4_11_13_cat23_mapBook.mxd jolliver 11/4/2016 1:33:19 PM

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Figure C4-11
CM 1.7 Category 2/3 Area
NAPL Observations and Cross-Sections
NAPL Evaluation
Newtown Creek RI/FS

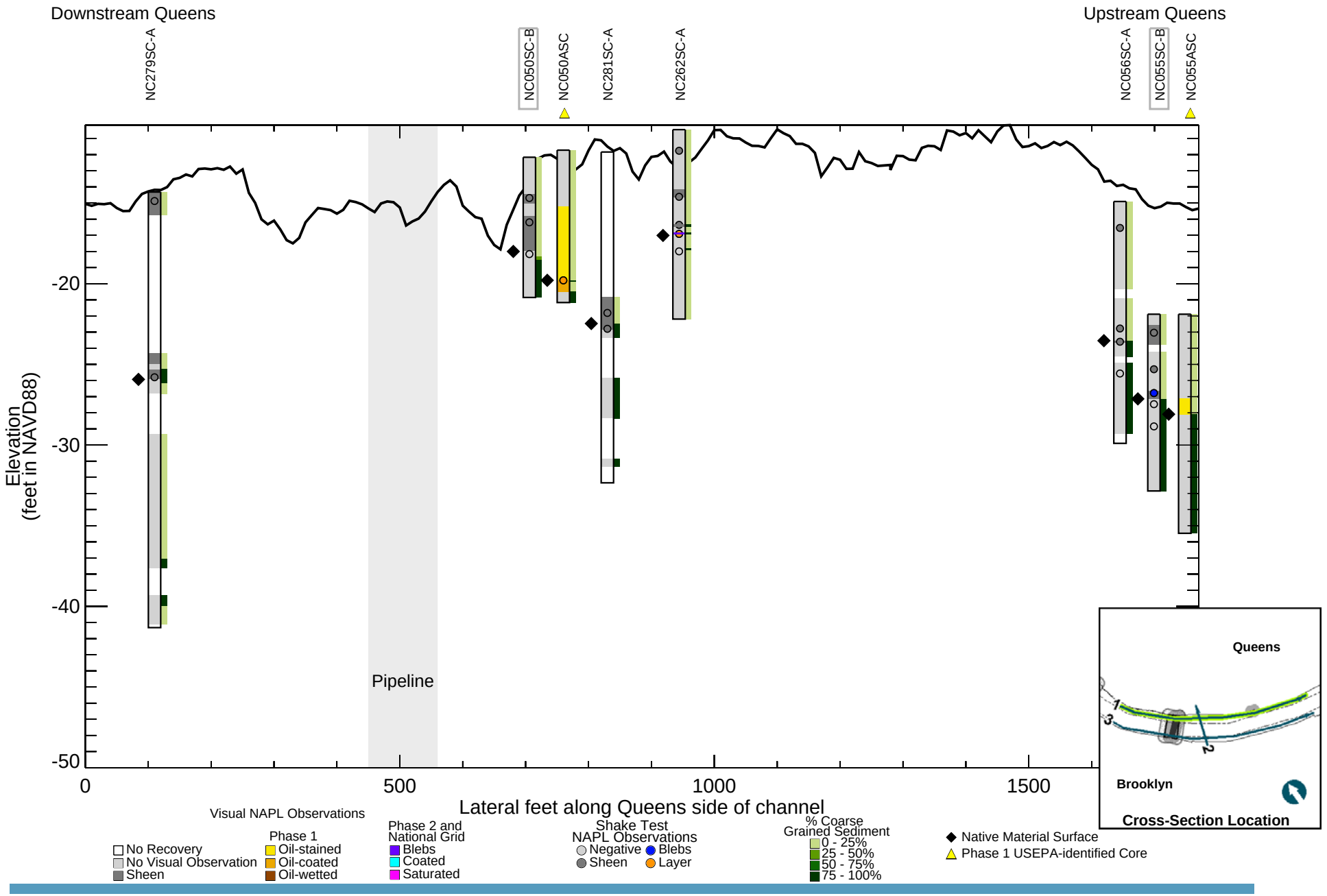


Figure C4-12a

CM 1.7 Category 2/3 Area - Cross-Section 1
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

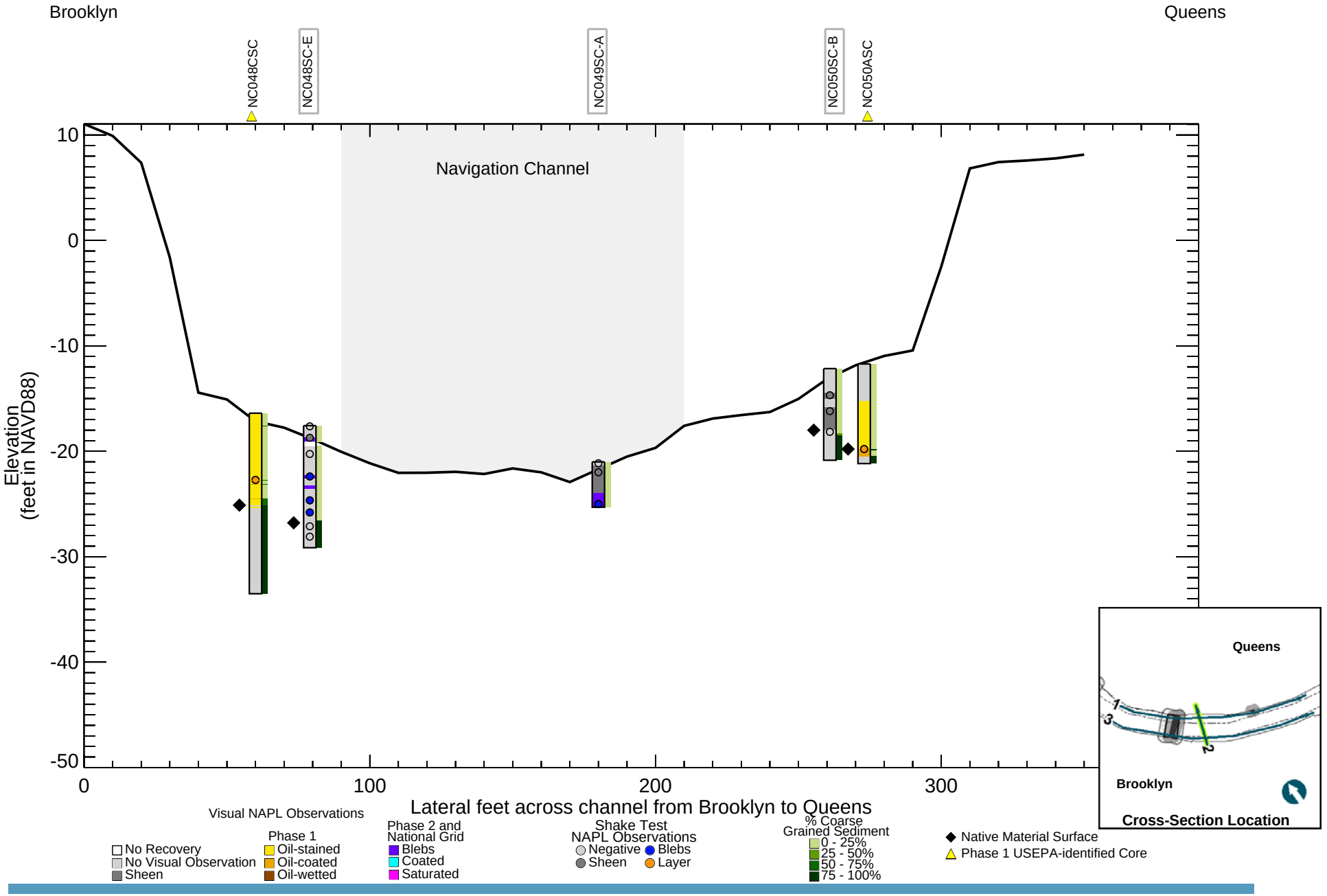


Figure C4-12b

CM 1.7 Category 2/3 Area - Cross-Section 2
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

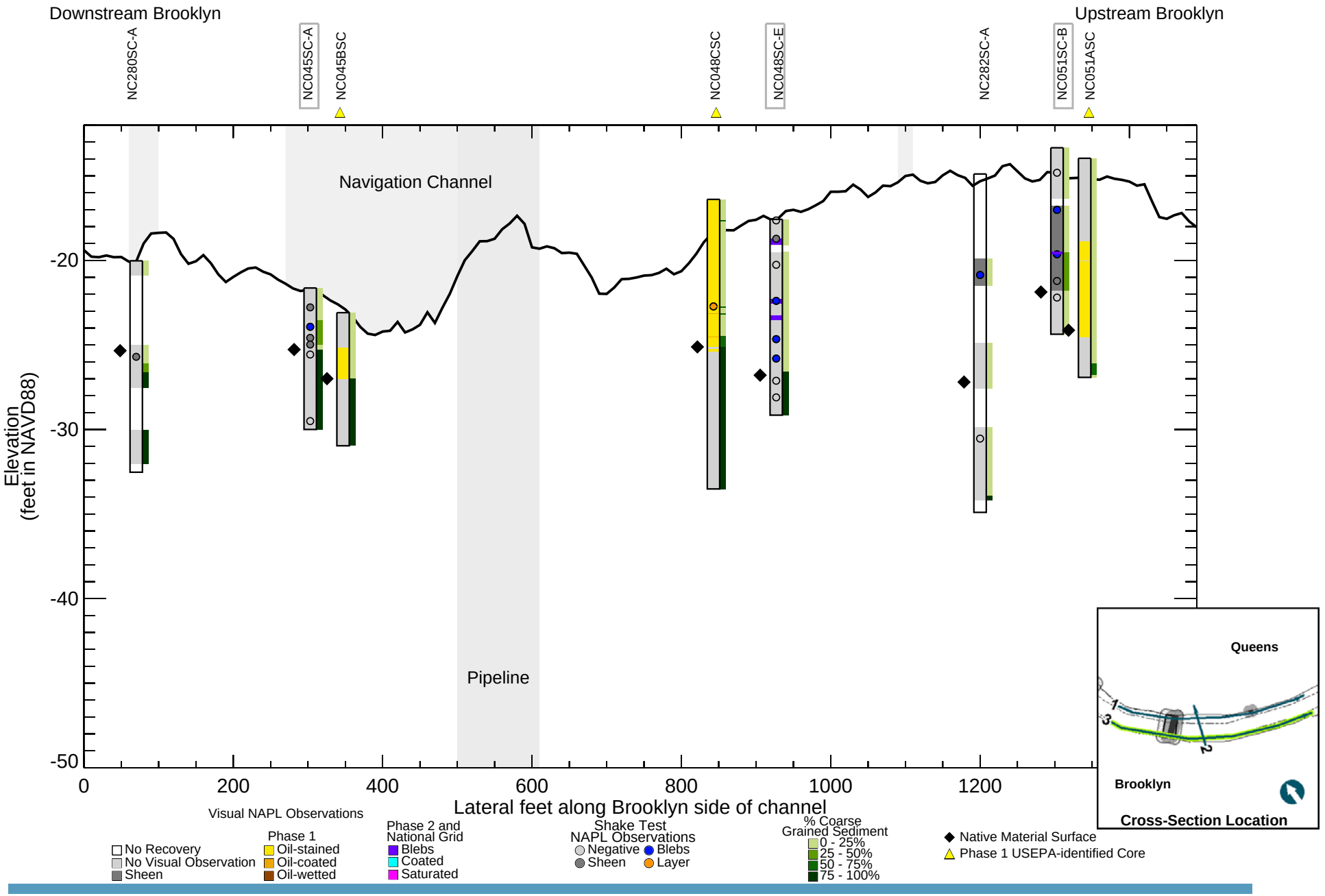
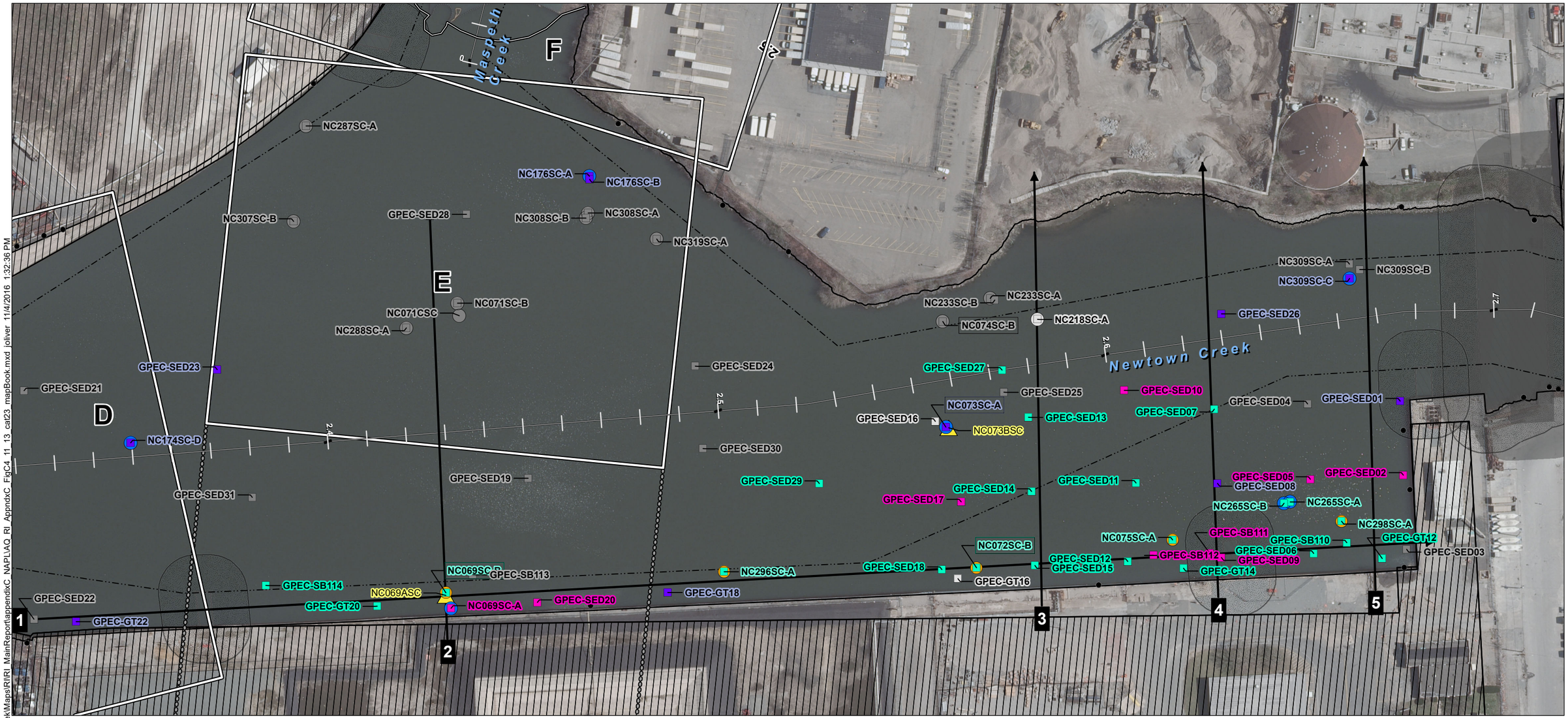


Figure C4-12c

CM 1.7 Category 2/3 Area - Cross-Section 3
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.



Upland Site of Potential Interest
Newtown Creek Study Area
Navigation Channel
Boom
Combined Sewer Overflow
Outfall

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
FOIA (50 feet)
NOAA (50 feet)

Shake Test
Layer
Blebs
Sheen
Negative

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Phase 1 USEPA-identified NAPL Core
Category 1B Evaluation Area
Category 1B Evaluation Area Before Adjustment
Cross-section
Creek Miles

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Category 1B Evaluation Area names (C, CM 2.2, D, E, F, G and H) are labeled when shown.
6. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
7. Category 1B Evaluation Areas CM 2.2 and E were adjusted based on the results of the NAPL Evaluation as described in Appendix C – NAPL Evalution Sections 4.3.3.3 and 4.4.1.2.
8. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 60 120 180 240

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Figure C4-13
Turning Basin Category 2/3 Area
NAPL Observations and Cross-Sections
NAPL Evaluation
Newtown Creek RI/FS

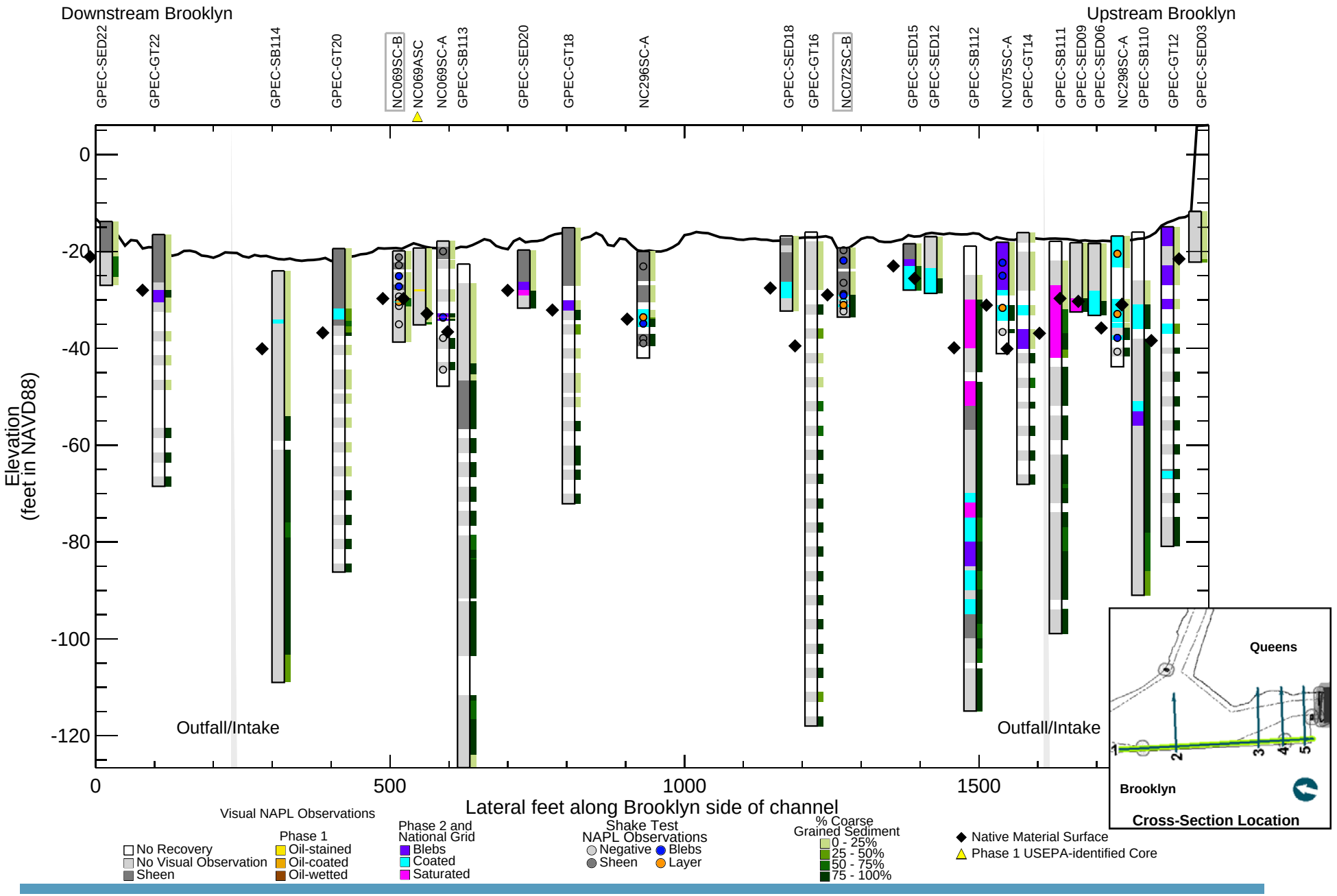


Figure C4-14a

Turning Basin Category 2/3 Area - Cross-Section 1
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

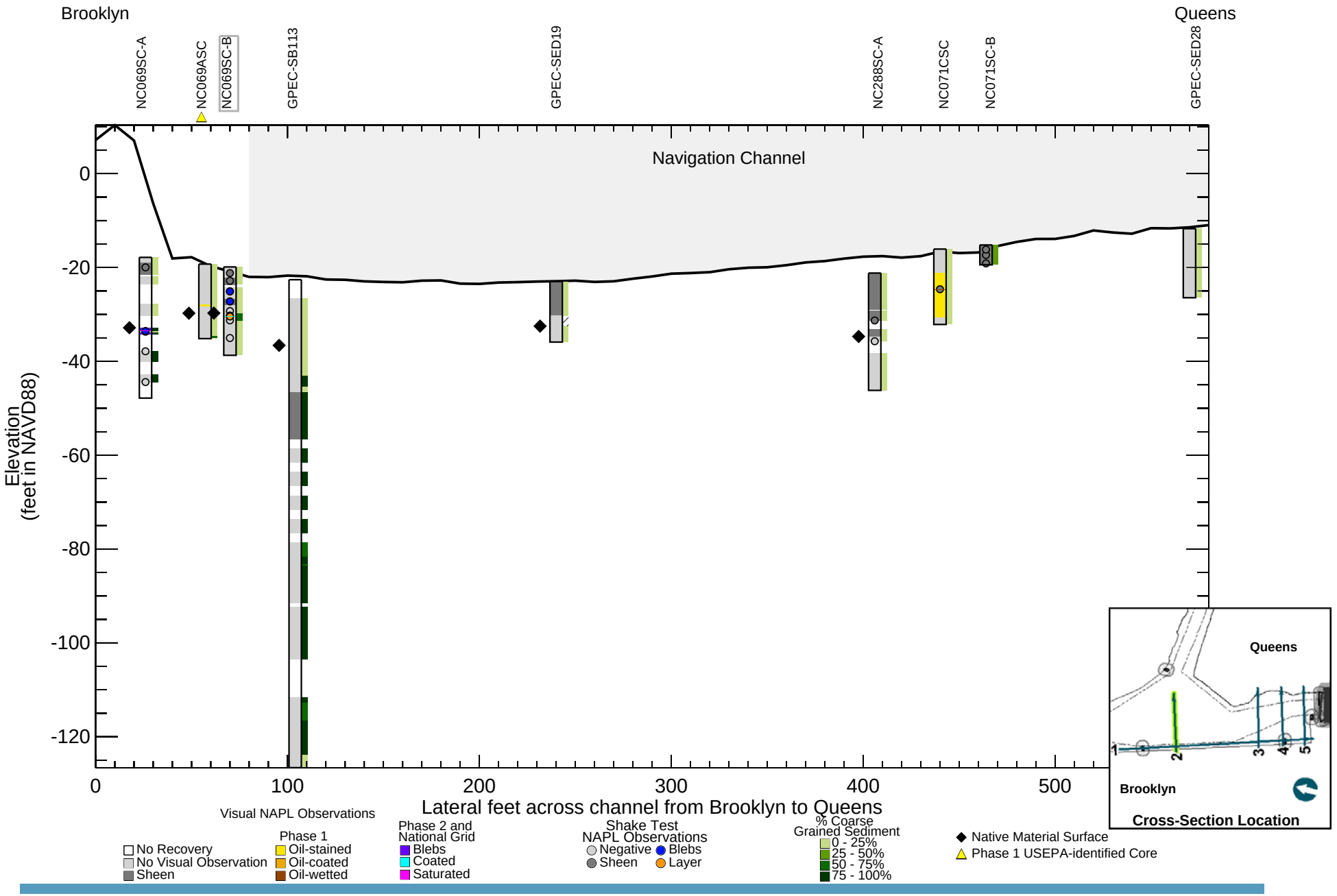


Figure C4-14b

Turning Basin Category 2/3 Area - Cross-Section 2
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

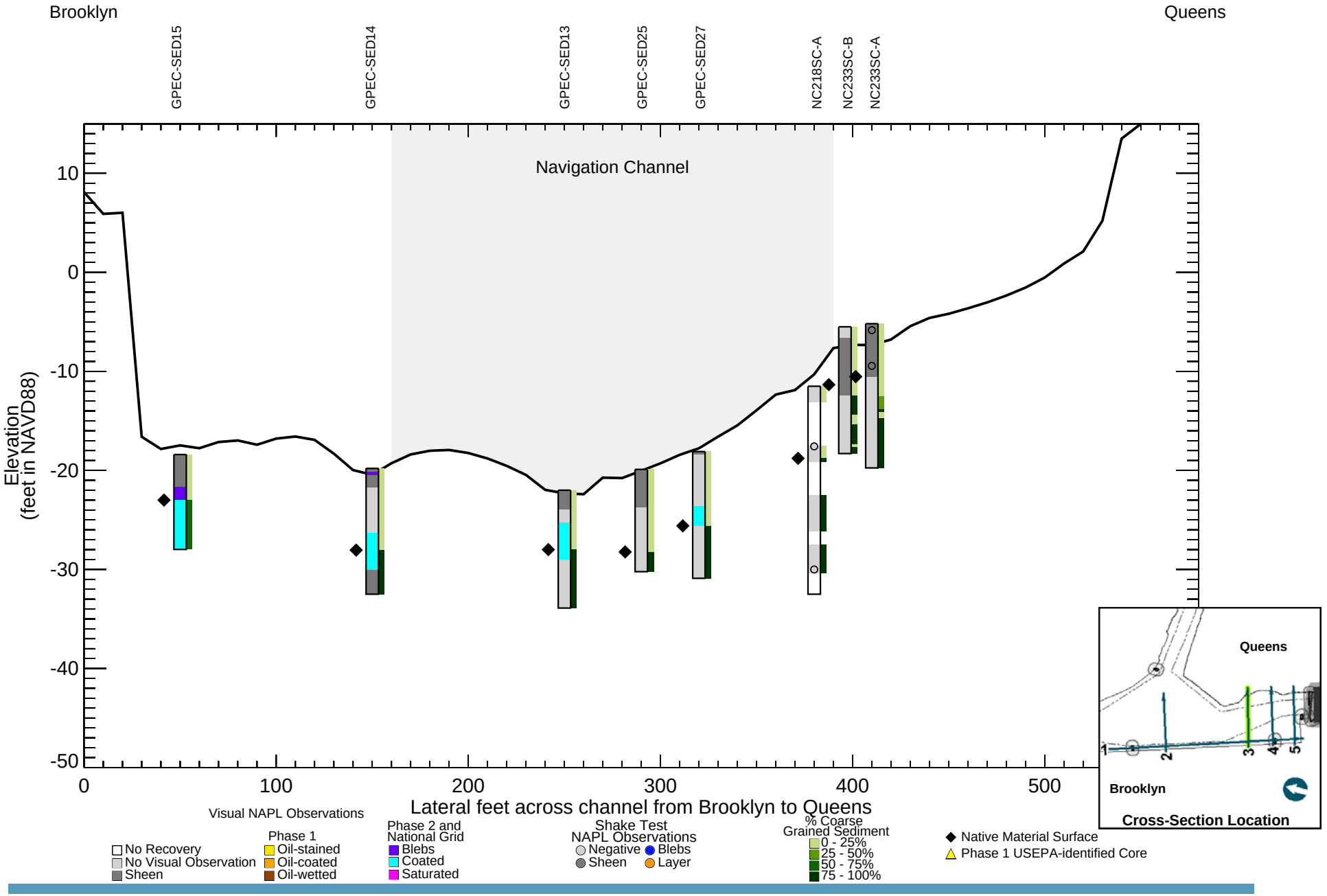


Figure C4-14c

Turning Basin Category 2/3 Area - Cross-Section 3
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

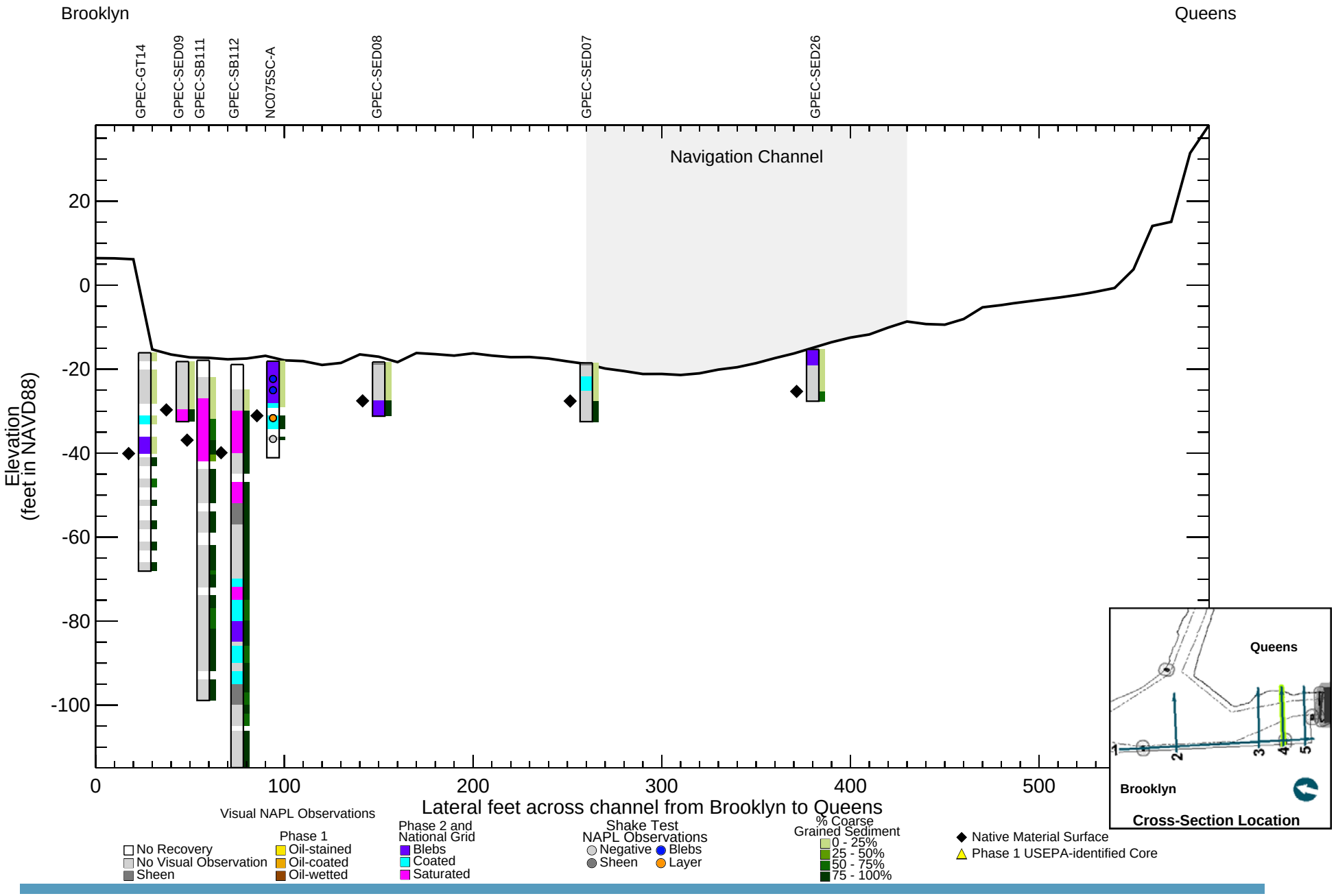


Figure C4-14d

Turning Basin Category 2/3 Area - Cross-Section 4
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

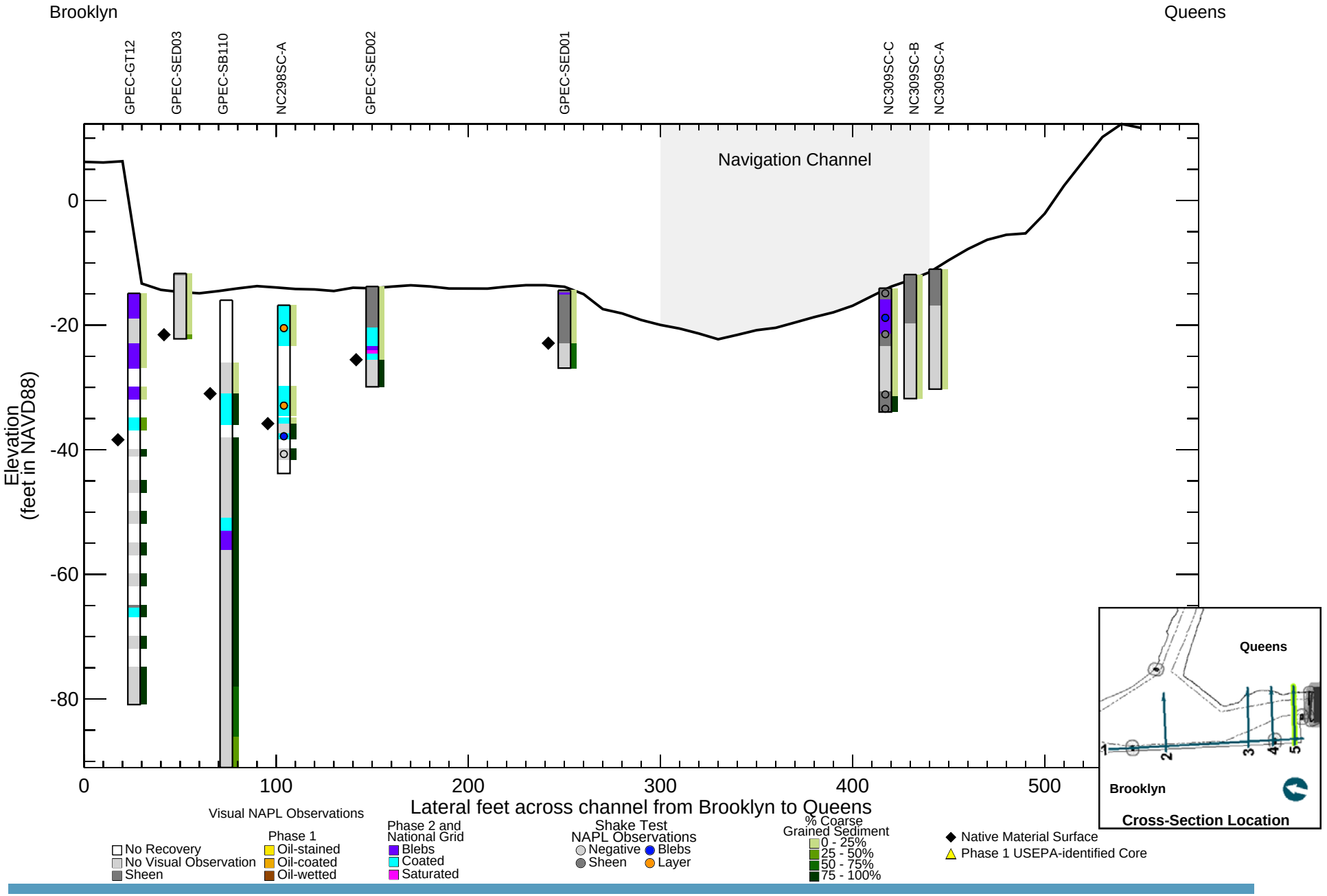
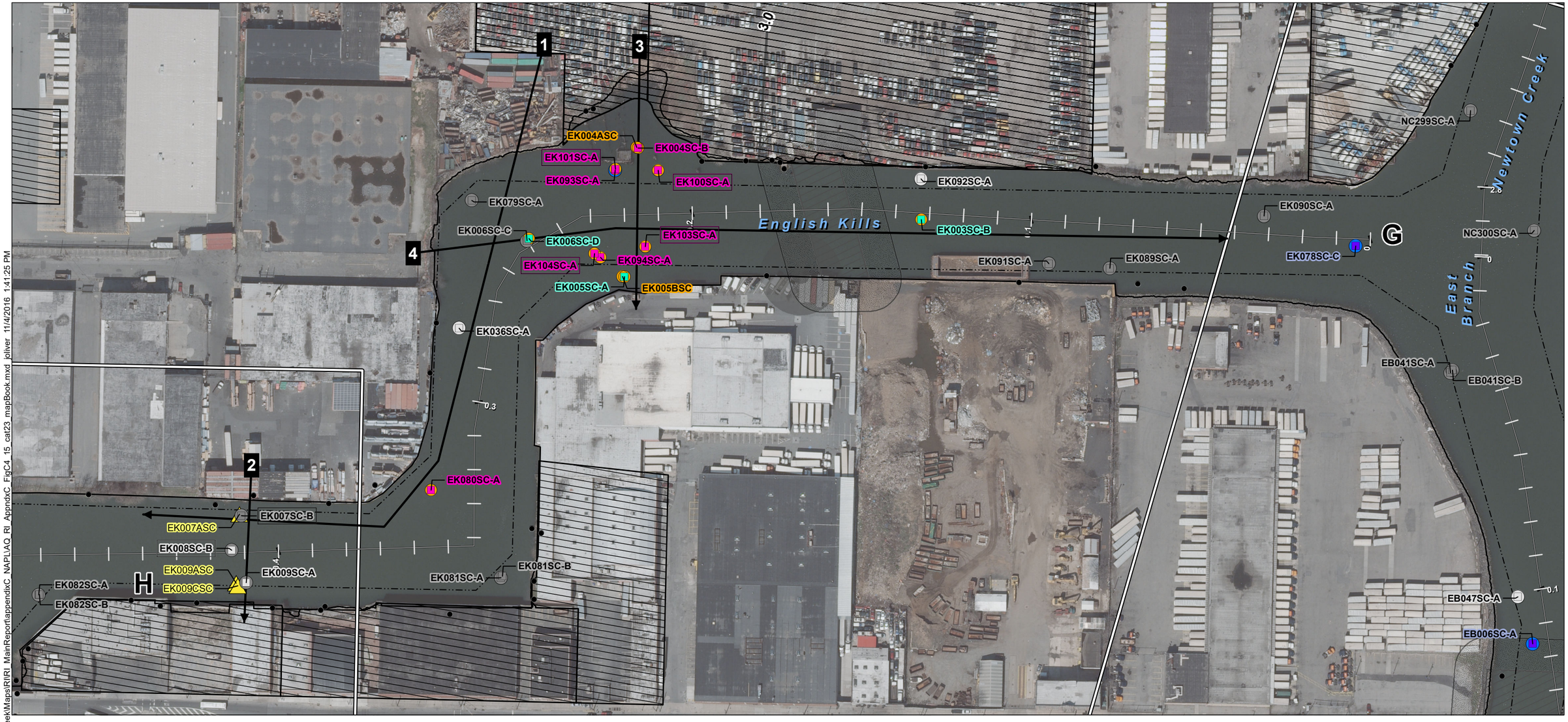


Figure C4-14e

Turning Basin Category 2/3 Area - Cross-Section 5
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.



Upland Site of Potential Interest
Newtown Creek Study Area
Navigation Channel
Boom
Combined Sewer Overflow
Outfall

Utility Crossing
FOIA
NOAA

Utility Crossing Buffer
FOIA (50 feet)
NOAA (50 feet)

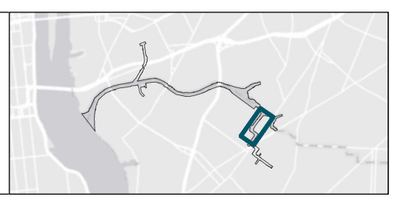
Shake Test
Layer
Blebs
Sheen
Negative

Visual Observation
Saturated
Coated
Blebs
Sheen
No Visual Observation

Phase 1 USEPA-identified NAPL Core
Category 1B Evaluation Area
Cross-section
Creek Miles

Notes:
1. Aerial imagery acquired from New York City Department of Information Technology and Telecommunications (2010).
2. Upland sites of interest with potential NAPL were identified by the U.S. Environmental Protection Agency and Newtown Creek Group.
3. Visual and shake test NAPL observations represent the most notable observations from entire core.
4. Phase 1 archive cores processed using Phase 2 methods are labeled with a box around the core ID.
5. Category 1B Evaluation Area names (C, CM 2.2, D, E, F, G and H) are labeled when shown.
6. Cores used in the NAPL Evaluation were collected during the Phase 1 and Phase 2 field programs, as well as cores collected by GEI, on behalf of National Grid in 2009 and 2010.
7. Creek mile hatches are shown every tenth mile and labeled every half mile.

Feet
0 75 150 225 300



Q:\Jobs\1107782-01_NewTownCreek\Maps\RI\RI_MainReport\appendix\C_NAPLAQ_RI_AppndxC_FigC4_15_cat23_mapBook.mxd joliver 11/4/2016 1:41:25 PM

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Figure C4-15
Lower English Kills Category 2/3 Area
NAPL Observations and Cross-Sections
NAPL Evaluation
Newtown Creek RI/FS

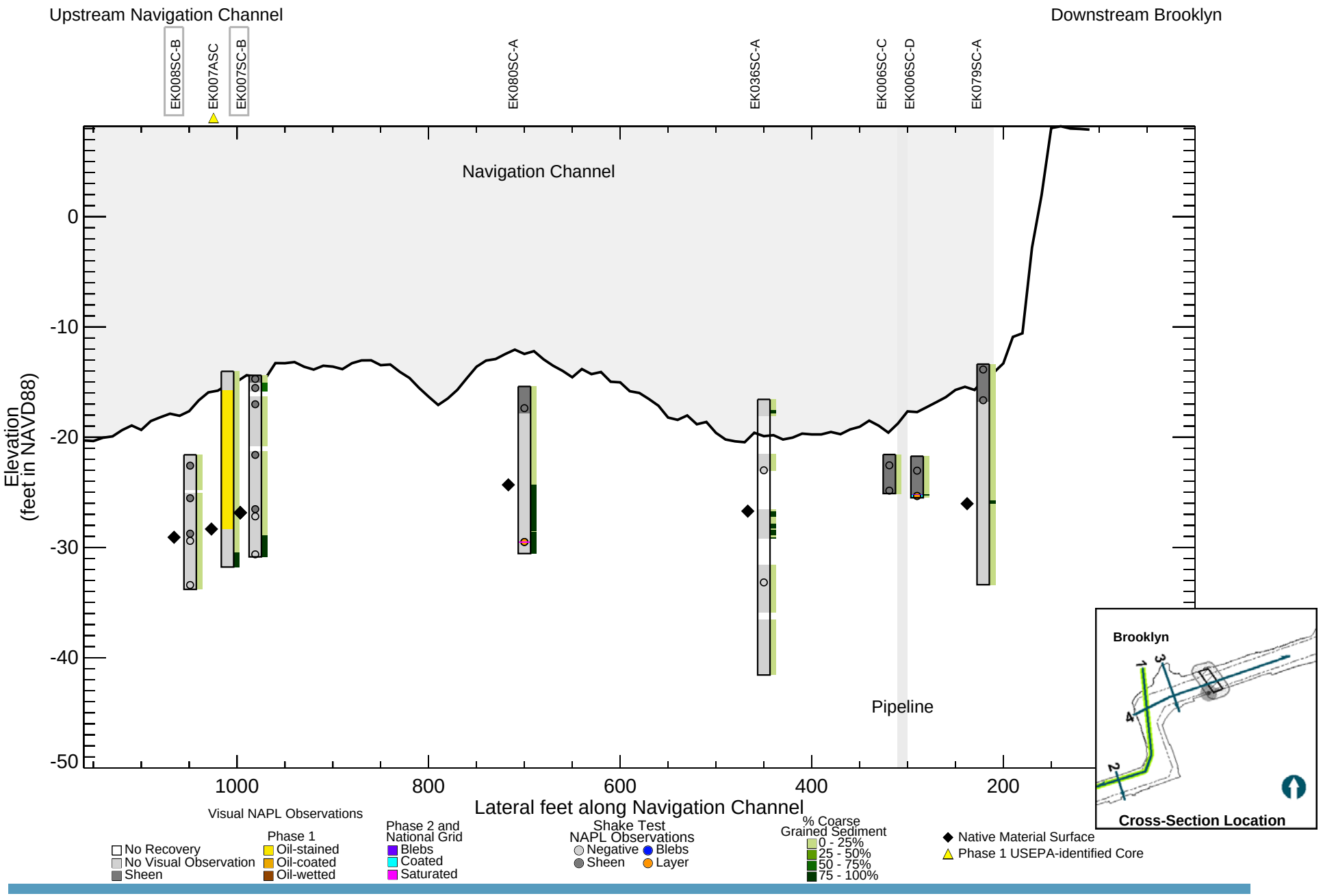


Figure C4-16a

Lower English Kills Category 2/3 Area - Cross-Section 1
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

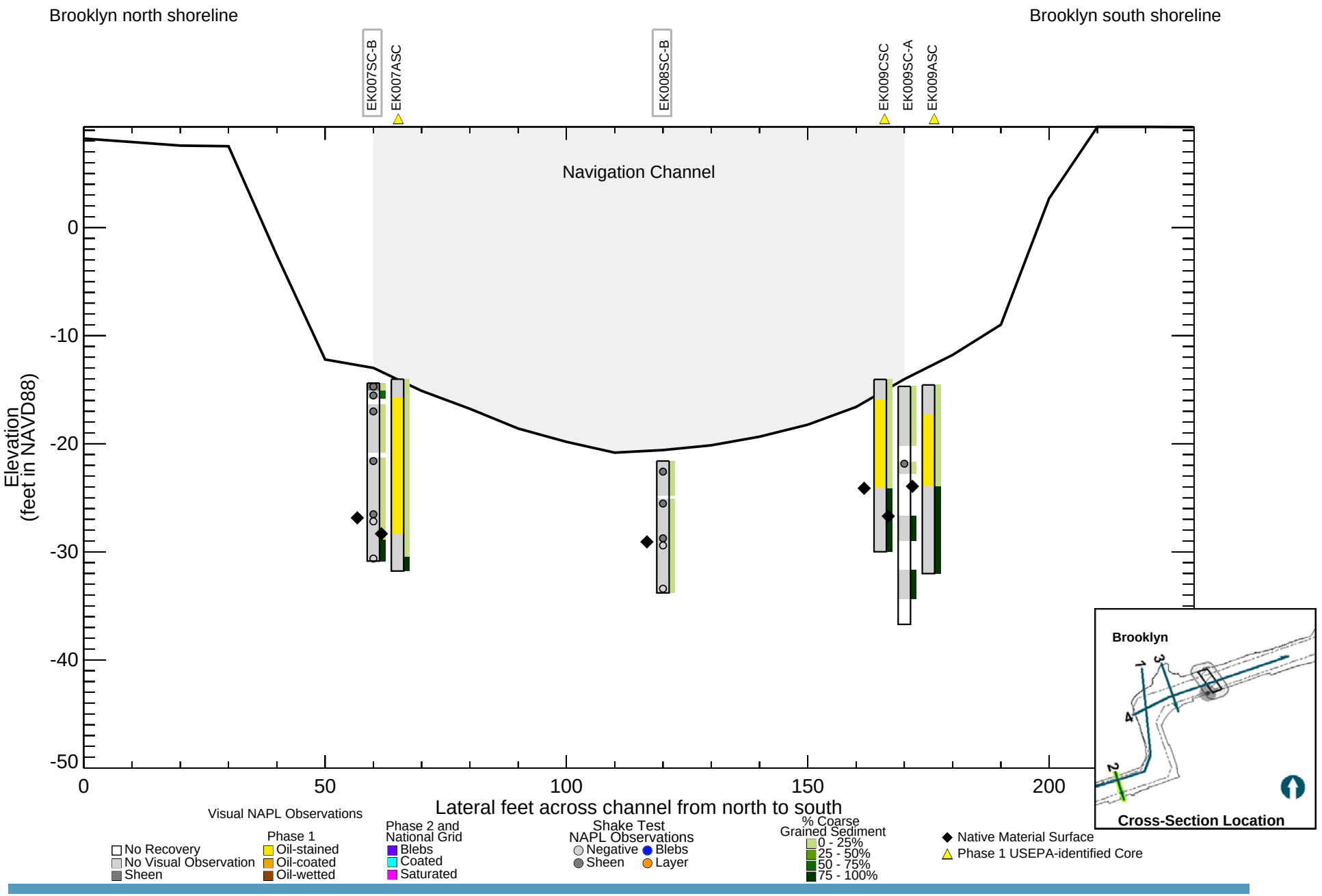


Figure C4-16b

Lower English Kills Category 2/3 Area - Cross-Section 2
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

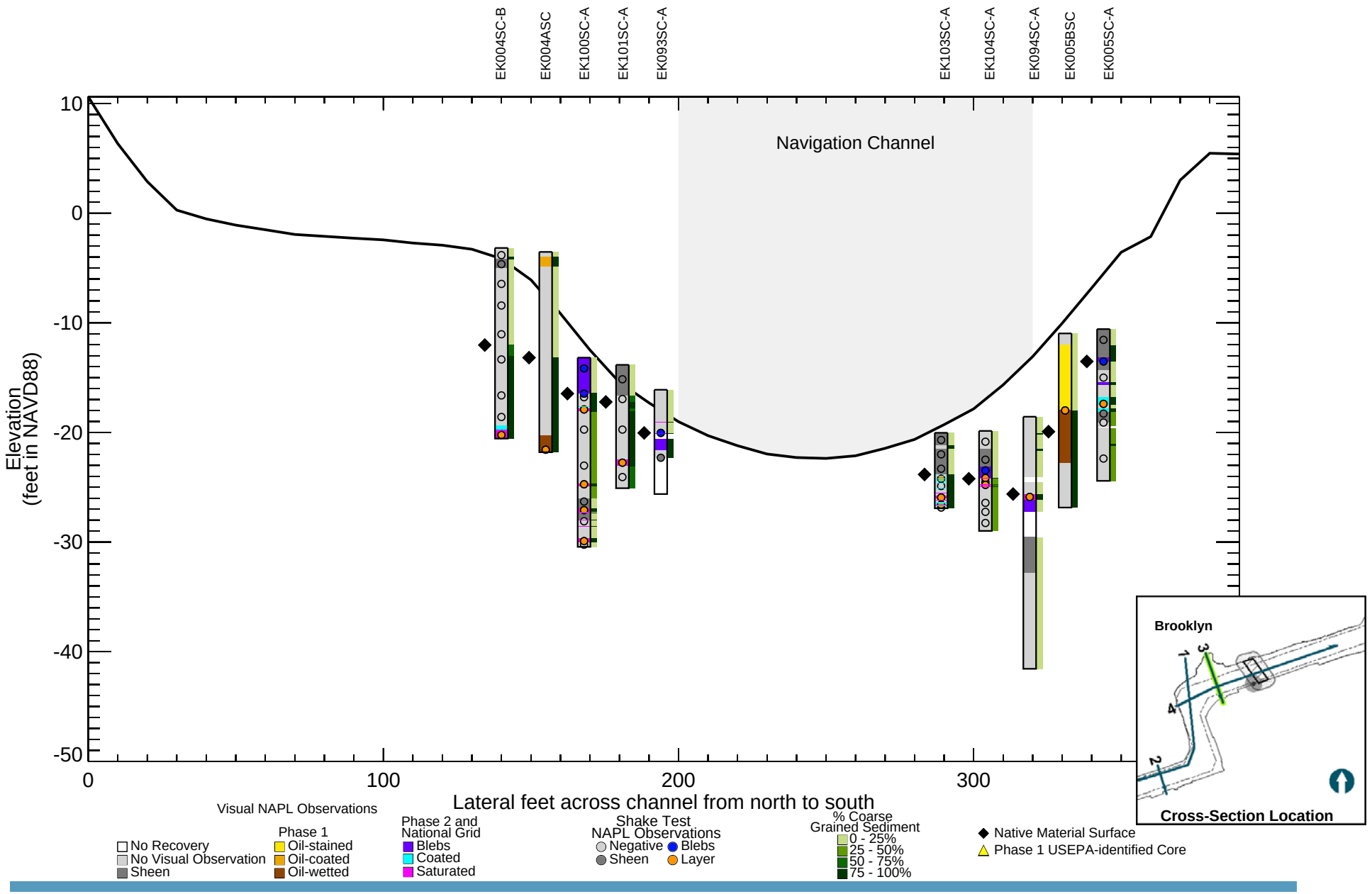


Figure C4-16c

Lower English Kills Category 2/3 Area - Cross-Section 3
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.

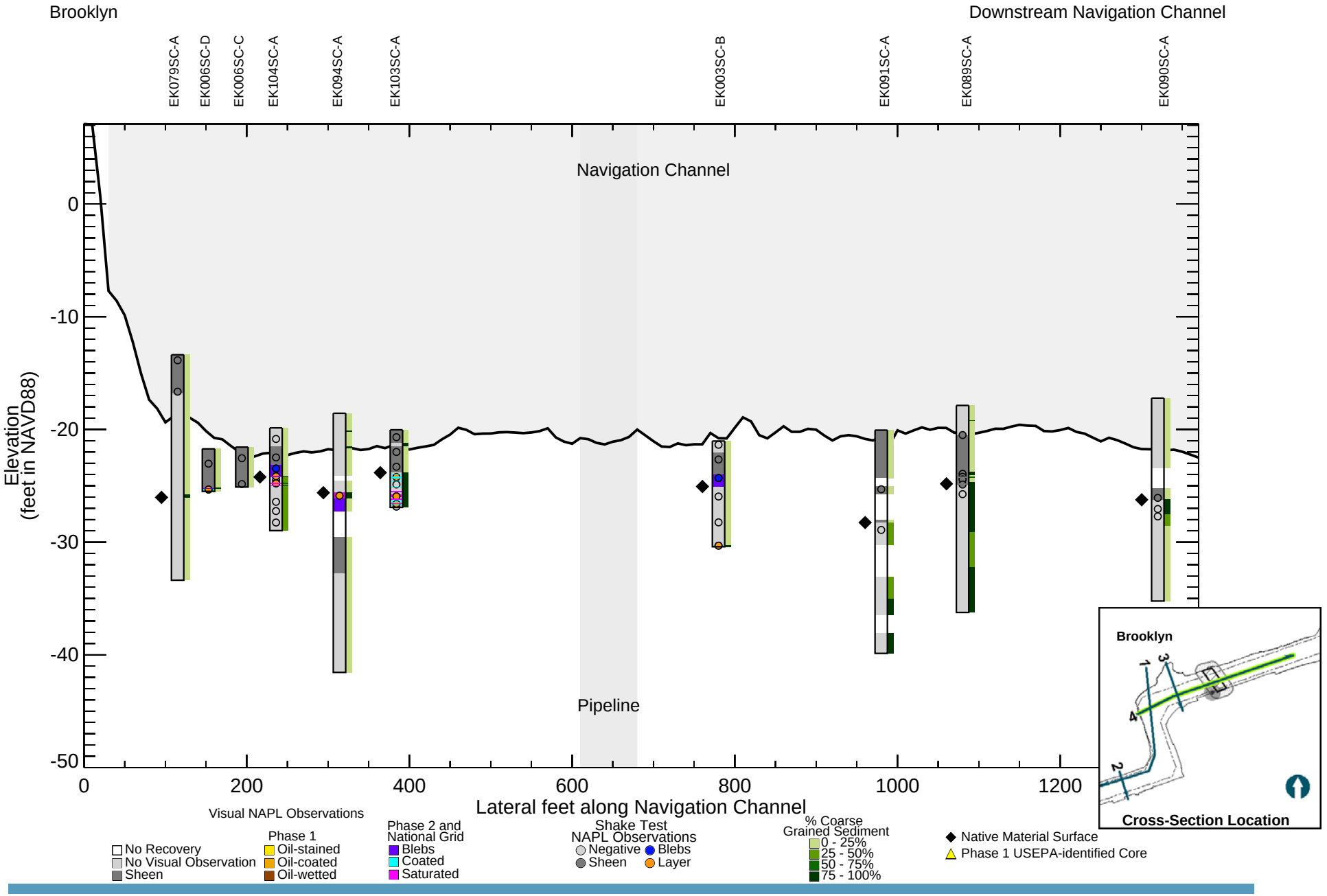
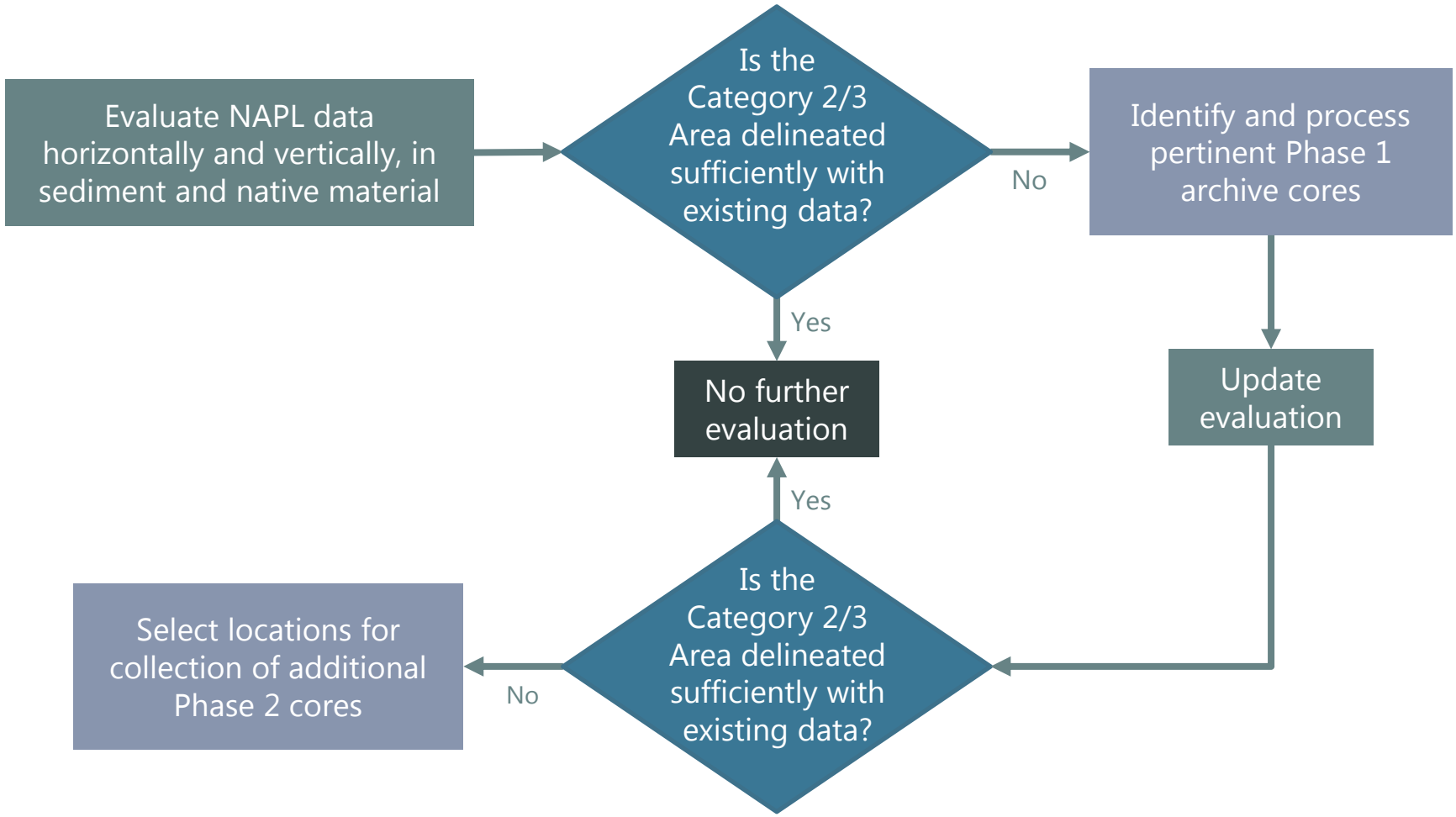


Figure C4-16d

Lower English Kills Category 2/3 Area - Cross-Section 4
NAPL Evaluation
Newtown Creek RI/FS

Notes: Shake test results include Phase 1 shake-tested cores. The top of core may not match mudline because cores are projected onto cross-sections. Core IDs of Phase 1 archive cores are identified at the top of each panel with a gray box around the core ID.



Note:
NAPL = nonaqueous phase liquid

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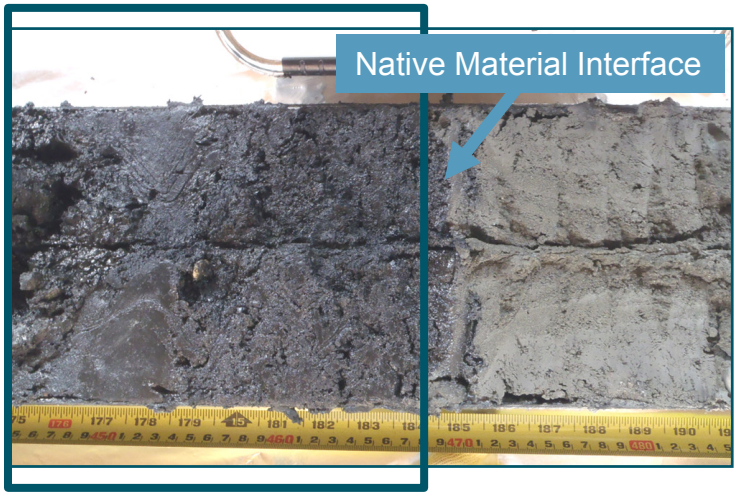
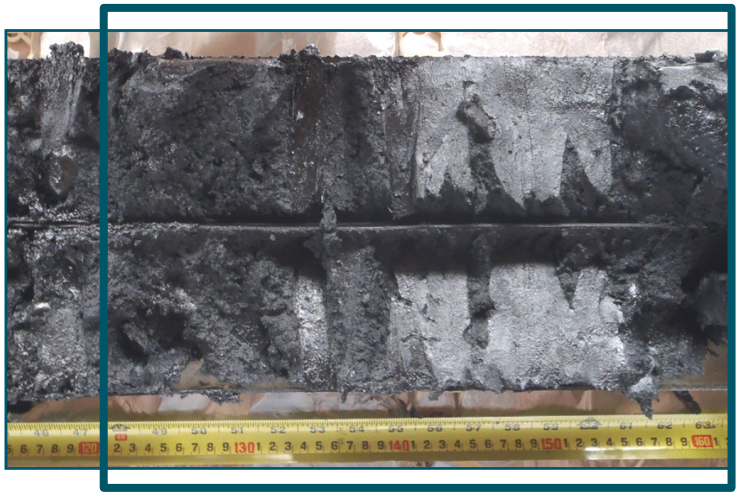
Figure C4-17
Process for Category 2/3 Evaluation
NAPL Evaluation
Newtown Creek RI/FS

ATTACHMENT C-A
REPRESENTATIVE SEDIMENT CORE PHOTOGRAPHS



NC251SC-A



NC258SC-A

NC306SC-C

EK085SC-D

Note: Blebs are discrete droplets of NAPL (typically not visible in photographs) in sediment.

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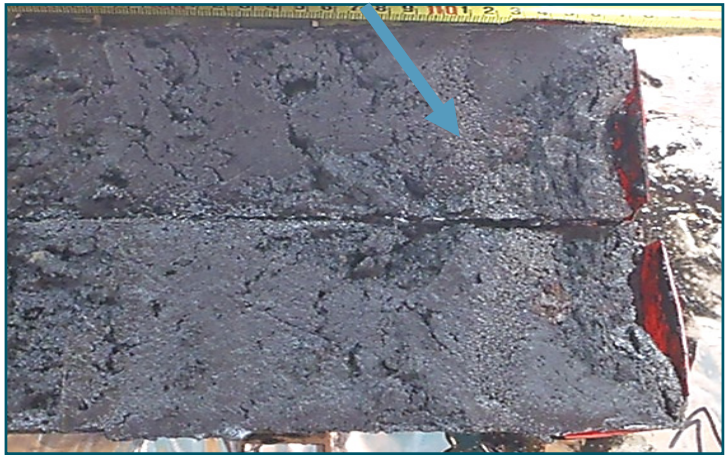
Figure C-A-1
Representative Sediment Core Photographs – Visual Observation of Blebs in Sediment
NAPL Evaluation
Newtown Creek RI/FS

Oil-coated sediment



EK006SC-D

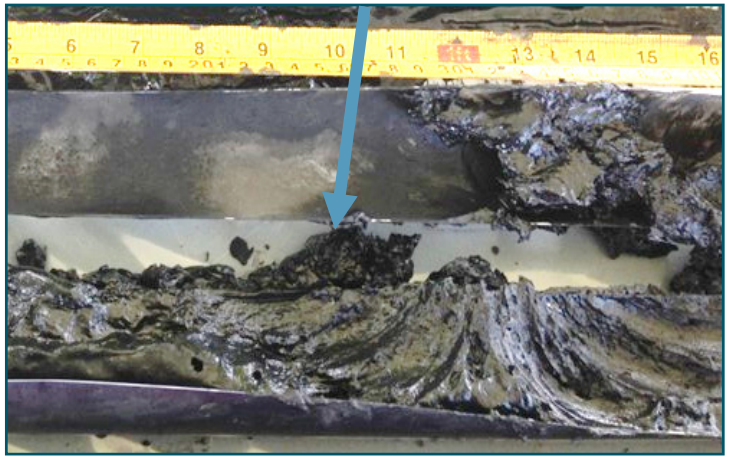
Oil-coated sediment

NC265SC-A

Oil-coated sediment

NC265SC-B

Oil-coated sediment



NC269SC-A

Note: In NAPL oil-coated sediment, the grains are coated with NAPL, but there is not sufficient NAPL present to fully saturate the pore spaces.

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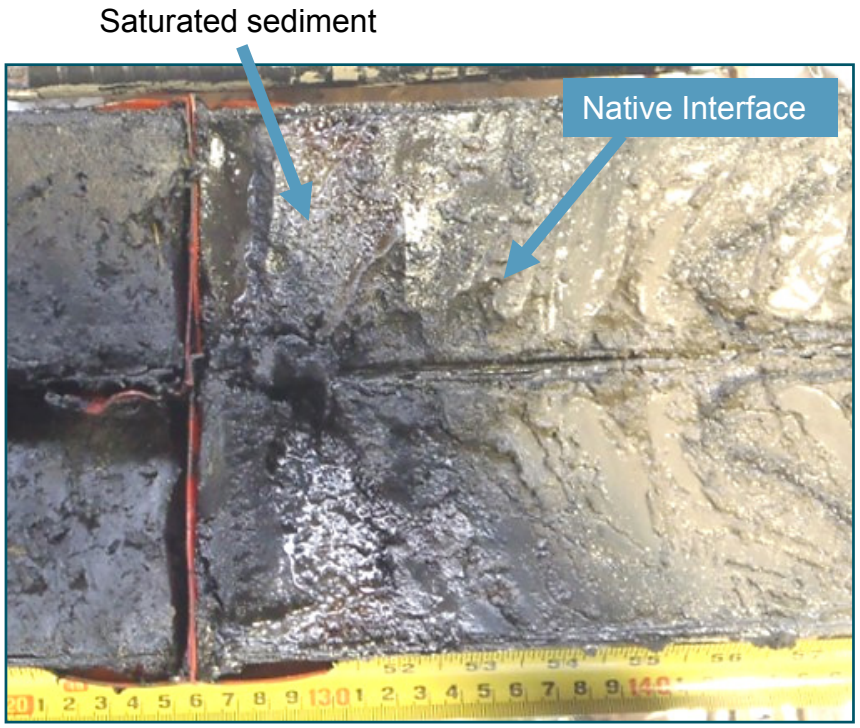
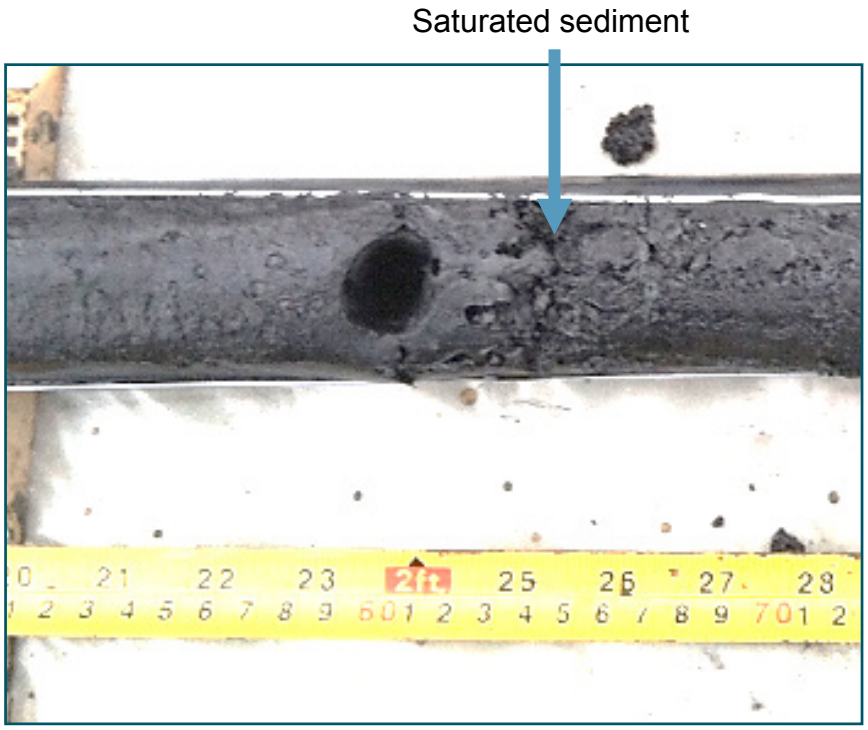
Figure C-A-2
Representative Sediment Core Photographs – Visual Observation of Oil-Coated Sediment
NAPL Evaluation
Newtown Creek RI/FS



EK104SC-A

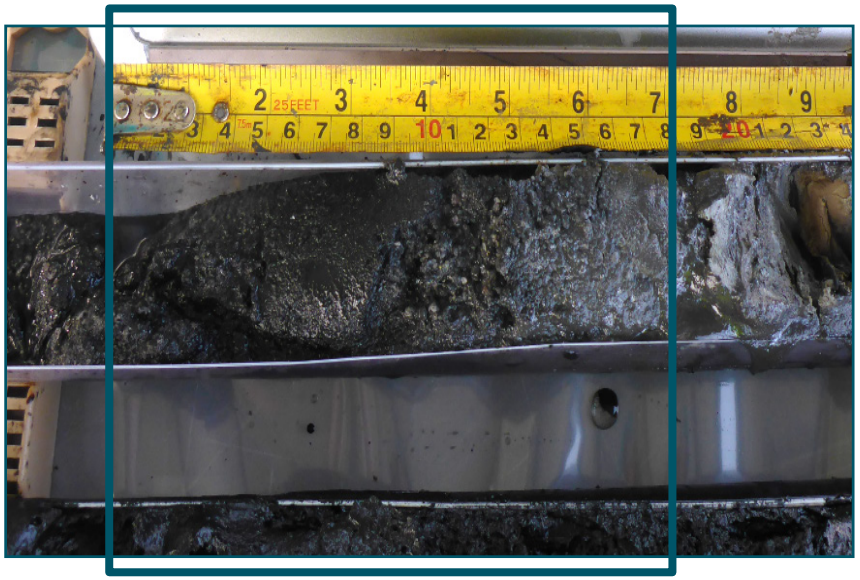


NC271SC-A

Note: In NAPL saturated sediment, the entirety of the sediment pore spaces is filled with NAPL.

Figure C-A-3
Representative Sediment Core Photographs – Visual Observation of Saturated in Sediment
NAPL Evaluation
Newtown Creek RI/FS

EK005SC-A

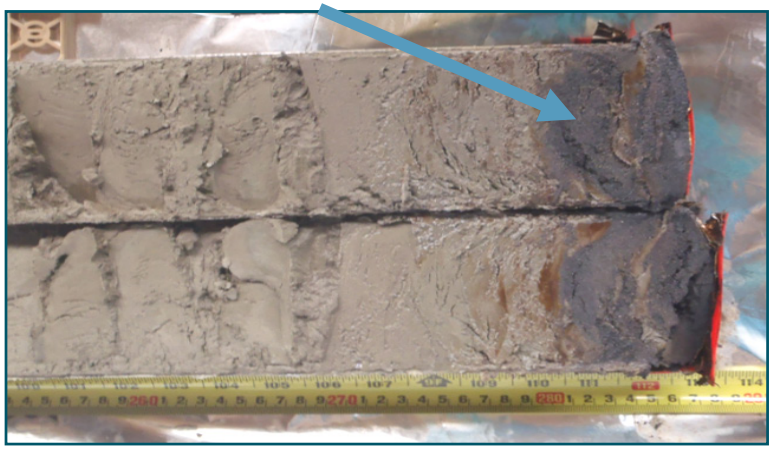


NC069SC-A

Note: Blebs are discrete droplets of NAPL (typically not visible in photographs) in sediment.

Figure C-A-4
Representative Sediment Core Photographs – Visual Observation of Blebs in Native Material
NAPL Evaluation
Newtown Creek RI/FS

Oil-coated native material



EK003SC-B

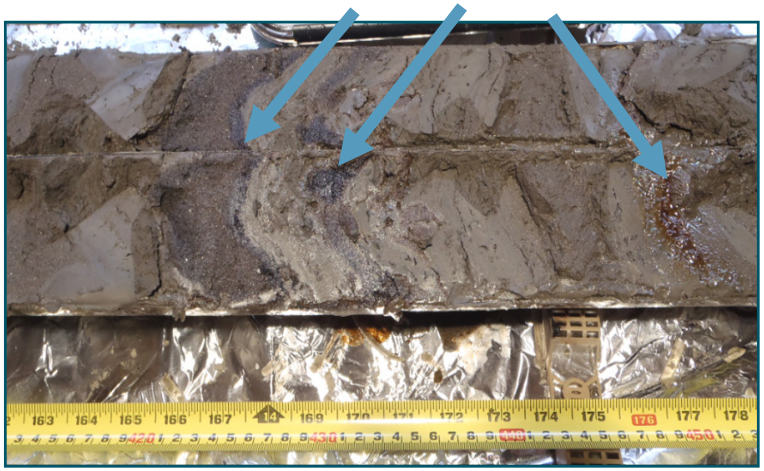
Oil-coated native material

NC072SC-B

Saturated native material

EK080SC-A

Saturated native material



EK100SC-A

Note: In NAPL oil-coated sediment, the grains are coated with NAPL, but there is not sufficient NAPL present to fully saturate the pore spaces. In NAPL saturated sediment, the entirety of the sediment pore spaces is filled with NAPL.

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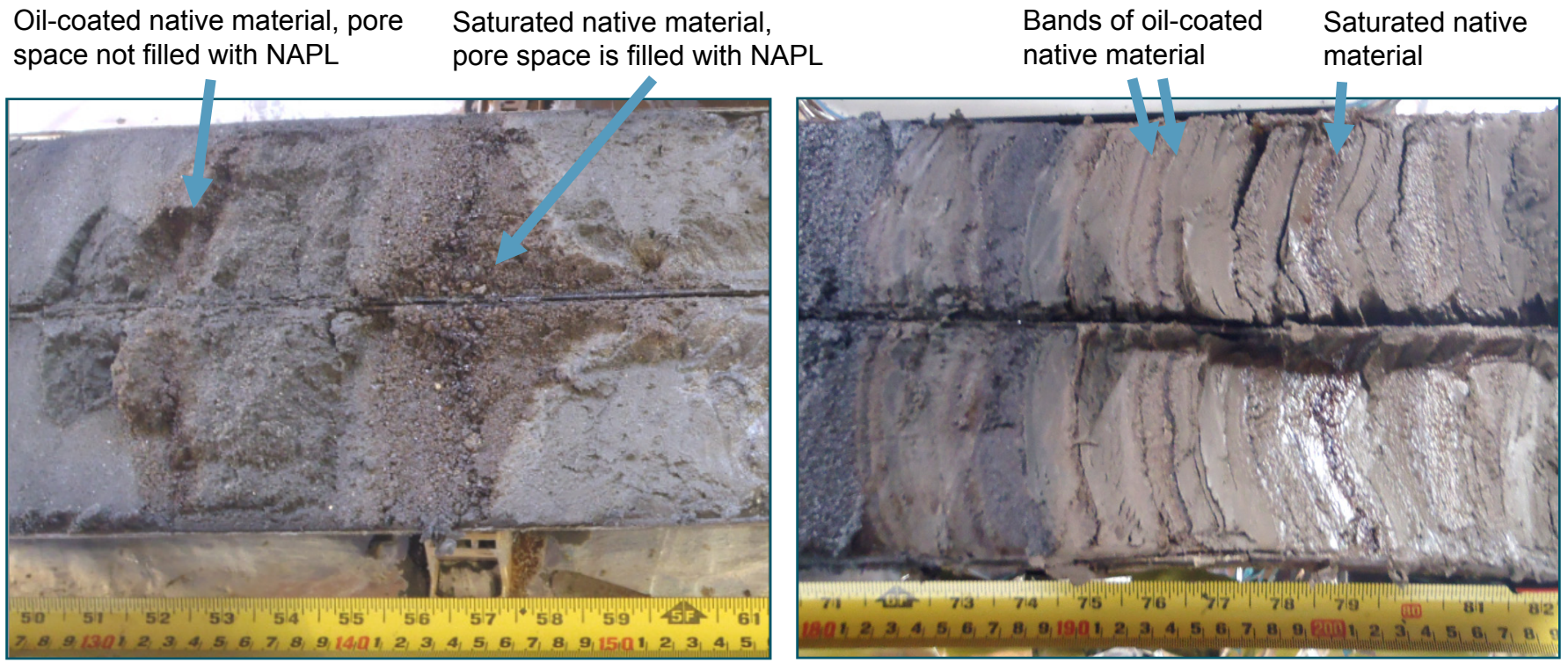
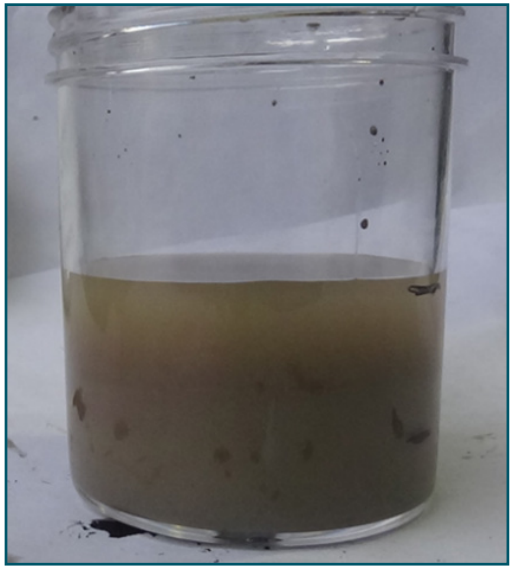
Figure C-A-5
Representative Sediment Core Photographs – Visual Observation of Oil-Coated and Saturated in Native Material – 1
NAPL Evaluation
Newtown Creek RI/FS

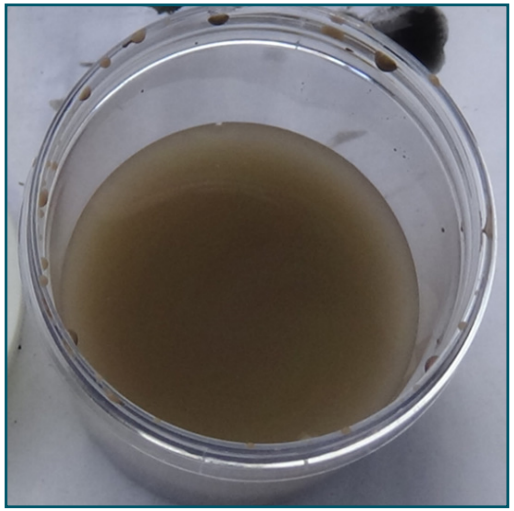


Note: In NAPL oil-coated sediment, the grains are coated with NAPL, but there is not sufficient NAPL present to fully saturate the pore spaces. In NAPL saturated sediment, the entirety of the sediment pore spaces is filled with NAPL.

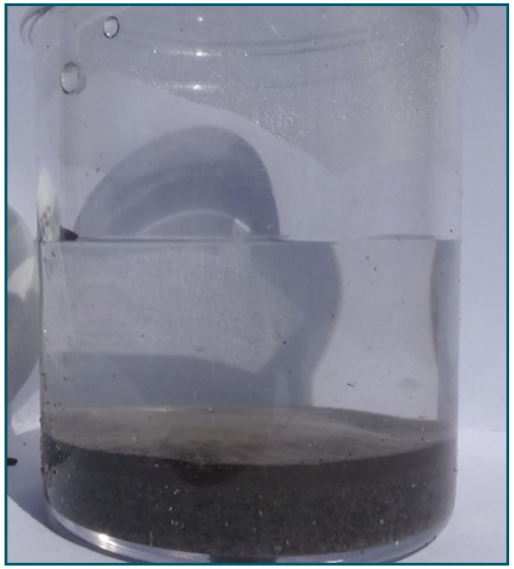
ATTACHMENT C-B
REPRESENTATIVE SHAKE TEST PHOTOGRAPHS

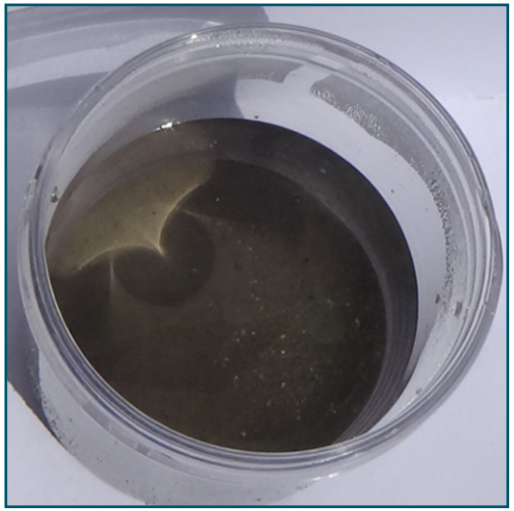
EK007SC-B





NC045SC-A





Negative Shake Tests Results: NAPL shake tests in which no sheen or NAPL is observed.

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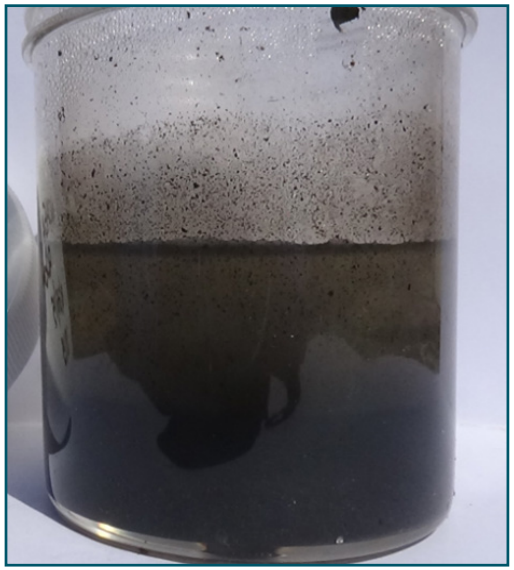
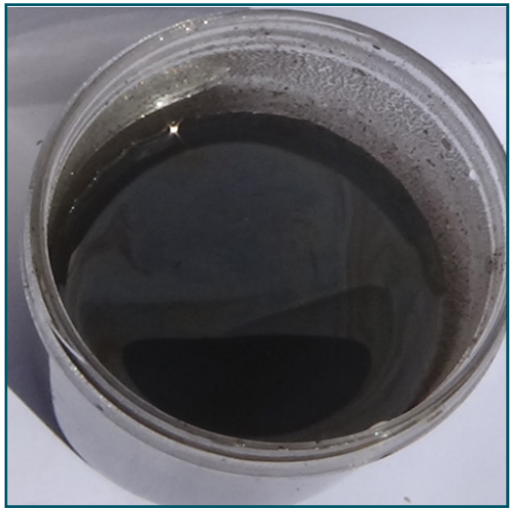
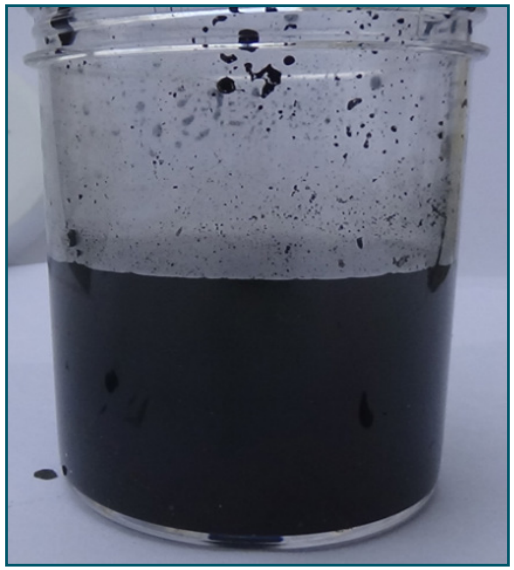
Figure C-B-1
Representative Shake Test Photographs – Negative Shake Test Results
NAPL Evaluation
Newtown Creek RI/FS

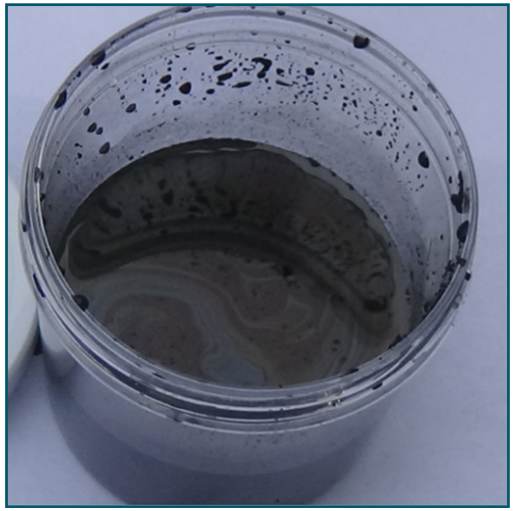
NC045SC-A



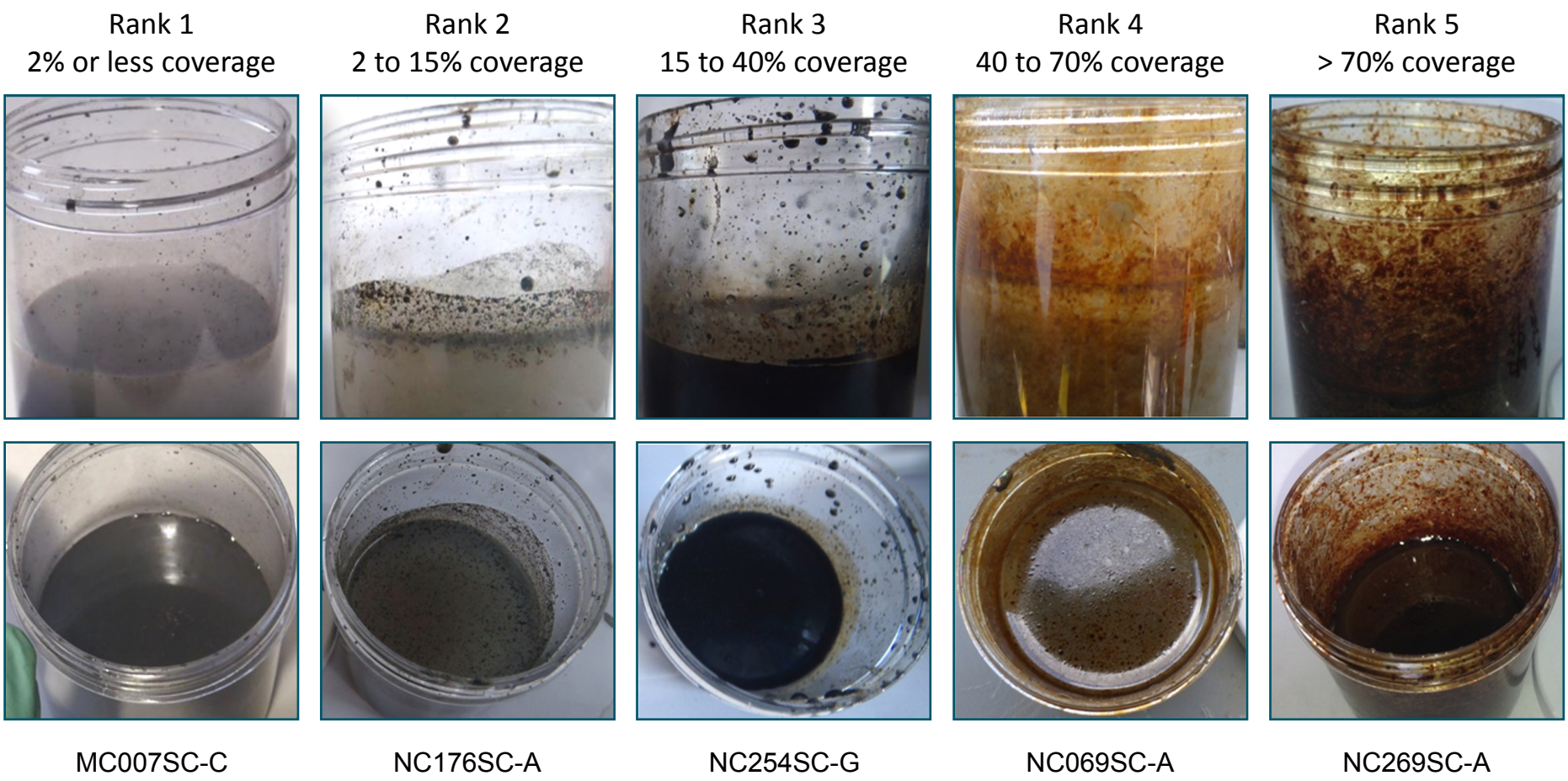


NC083SC-A





Shake Tests Resulting in Sheen: NAPL shake test results in which a sheen is present on the surface of the water; however, NAPL is not observed.



Shake Tests Resulting in Blebs: Shake test results in which discrete droplets of NAPL are present on the sidewalls of the shake test jar, on the water's surface, suspended in the water, or settled on the sediment surface submerged under the water in the jar. Coverage and accumulation determine the degree, or rank, of the observed blebs.

Figure C-B-3
Representative Shake Test Photographs – Bleb Shake Test Results
NAPL Evaluation
Newtown Creek RI/FS

EK004SC-B

EK100SC-A

Shake Tests Resulting in Layer: Shake tests where NAPL appears as a distinct layer within the shake test jar.

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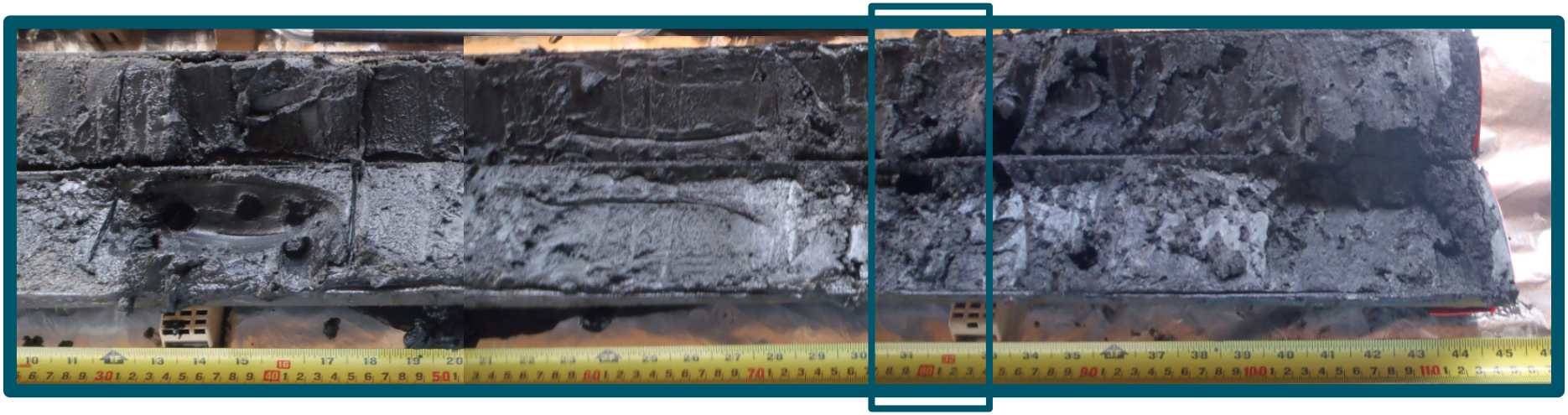
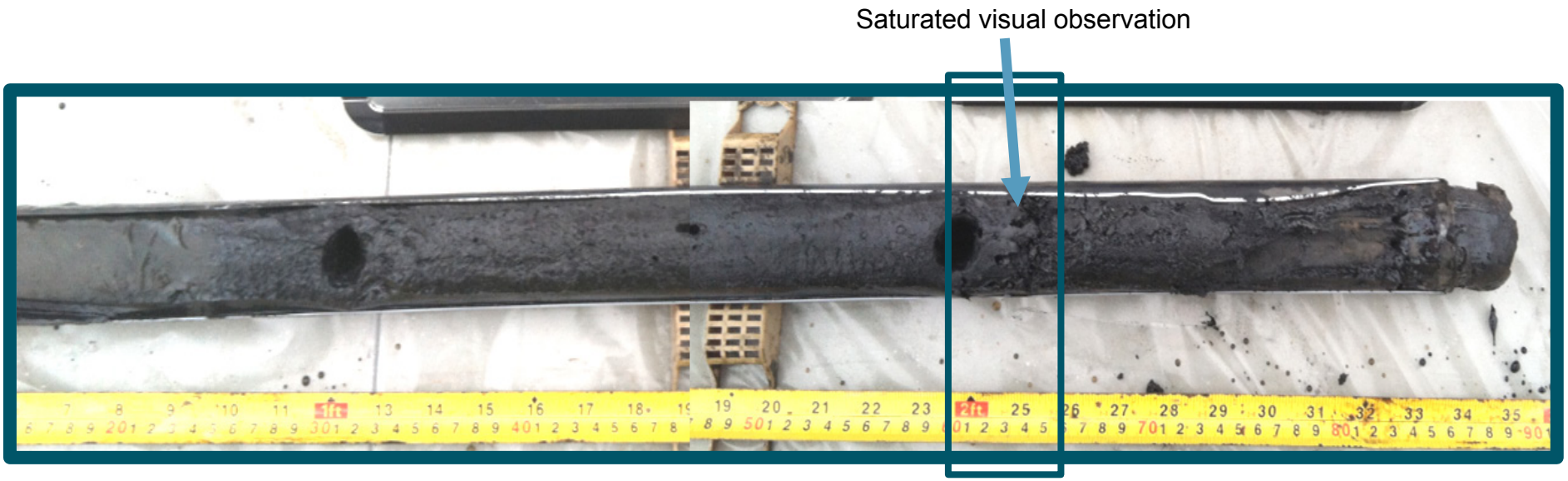
Figure C-B-4
Representative Shake Test Photographs – Layer Shake Test Results
NAPL Evaluation
Newtown Creek RI/FS

ATTACHMENT C-C
CATEGORY IB ADDITIONAL EVALUATION PHOTOGRAPHS

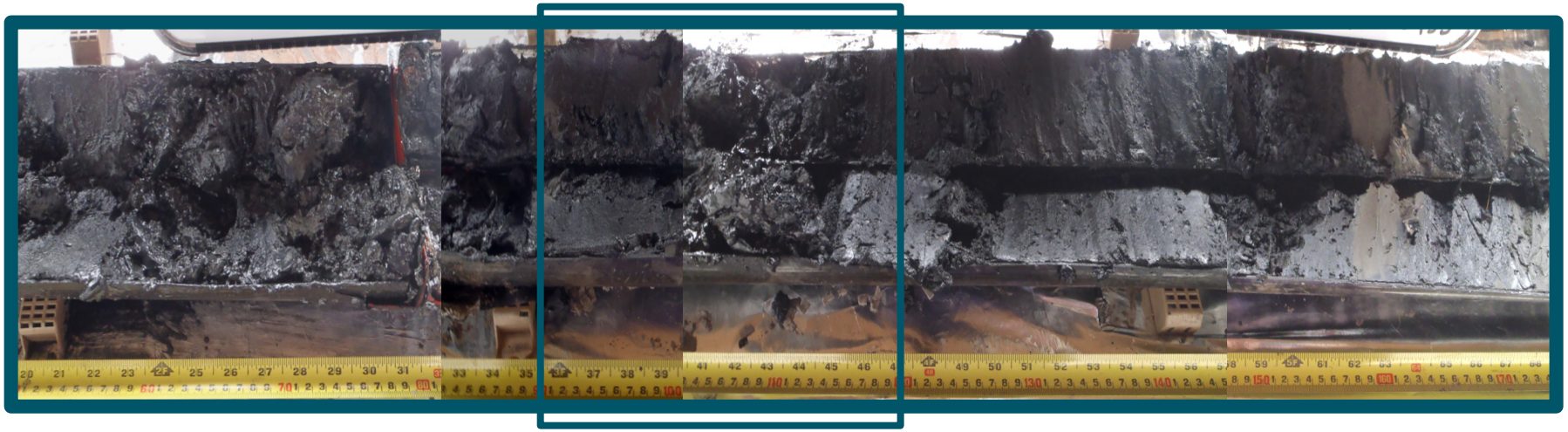


NC254SC-G Phase 2 Core: Visual observation of blebs (75 to 84 centimeters below mudline); shake test bleb rank 3 (80 centimeters below mudline)

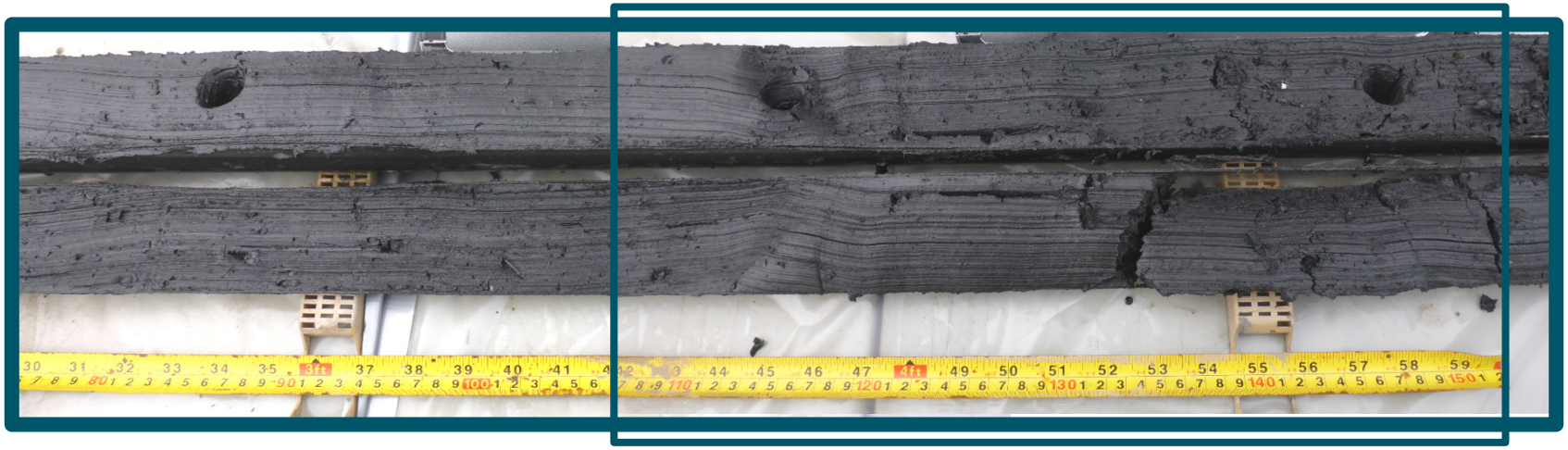
Note: Blebs are discrete droplets of NAPL (typically not visible in photographs) in sediment.



NC271SC-A Phase 2 Core: Saturated visual observation (182 to 188 centimeters below mudline); shake test bleb rank 2 (184 centimeters below mudline)



NC261SC-A Phase 2 Core: Visual observations of blebs (90 to 120 centimeters below mudline); shake test bleb rank 2 (100 to 120 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site



NC277SC-A Phase 2 Core: Visual observation of blebs (107 to 152 centimeters below mudline); shake test bleb rank 2 (140 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site

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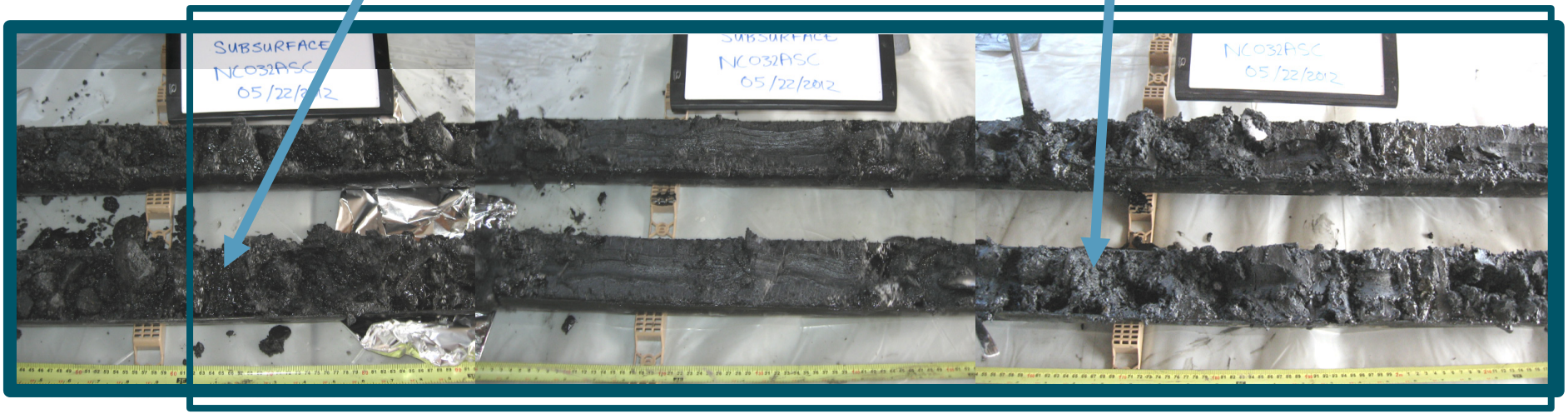
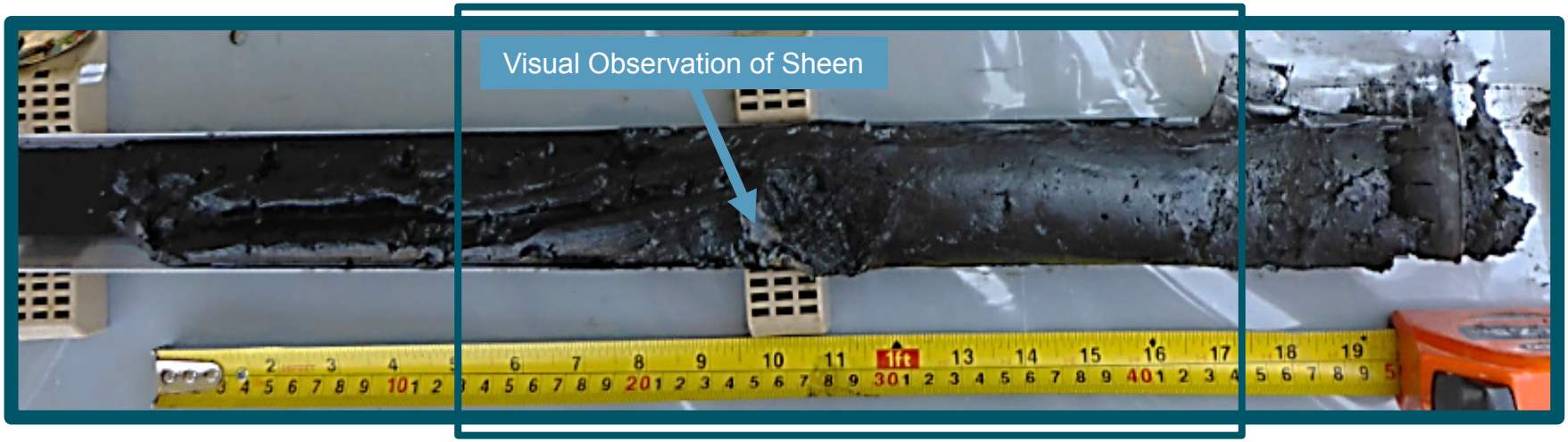
Figure C-C-3
Category 1B Additional Evaluation Photographs – Area C – 1
NAPL Evaluation
Newtown Creek RI/FS

NC276SC-A Phase 2 Core: Visual observation of blebs (60 to 110 centimeters below mudline); shake test bleb rank 3 (80 centimeters below mudline)

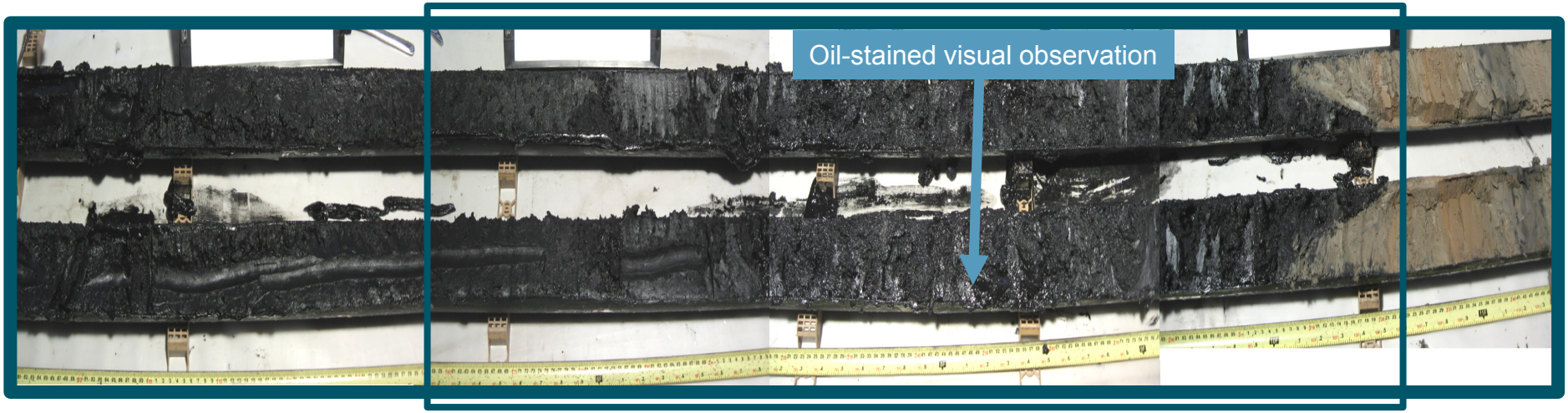
NC045BSC Phase 1 USEPA-Identified Core: Oil-stained visual observation (63 to 119 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site



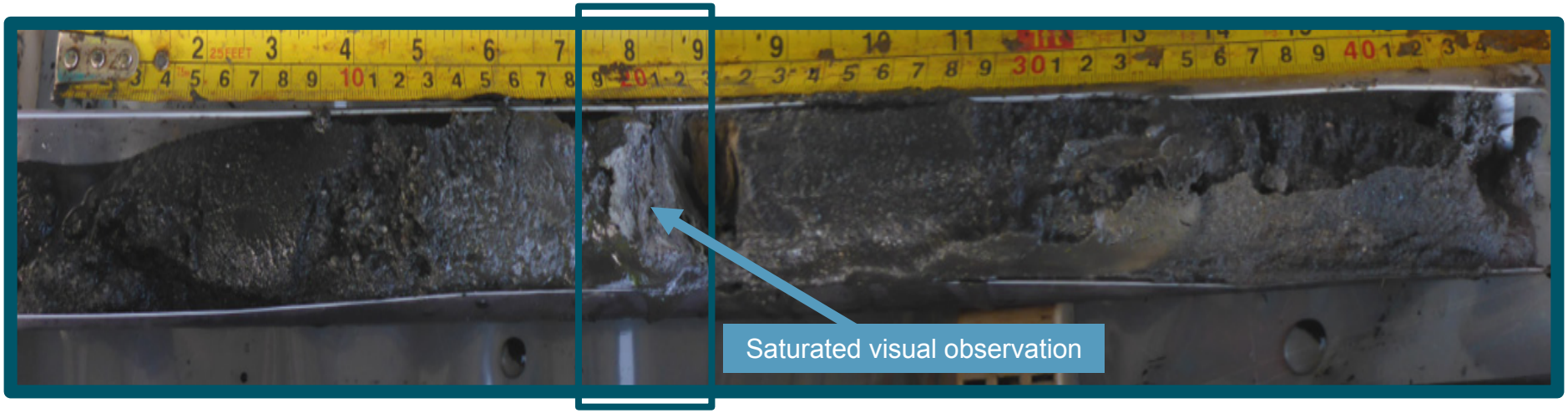
NC032ASC Phase 1 USEPA-Identified Core: Oil-wetted visual observation (62 to 69 centimeters below mudline), oil-coated visual observation (69 to 302 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site



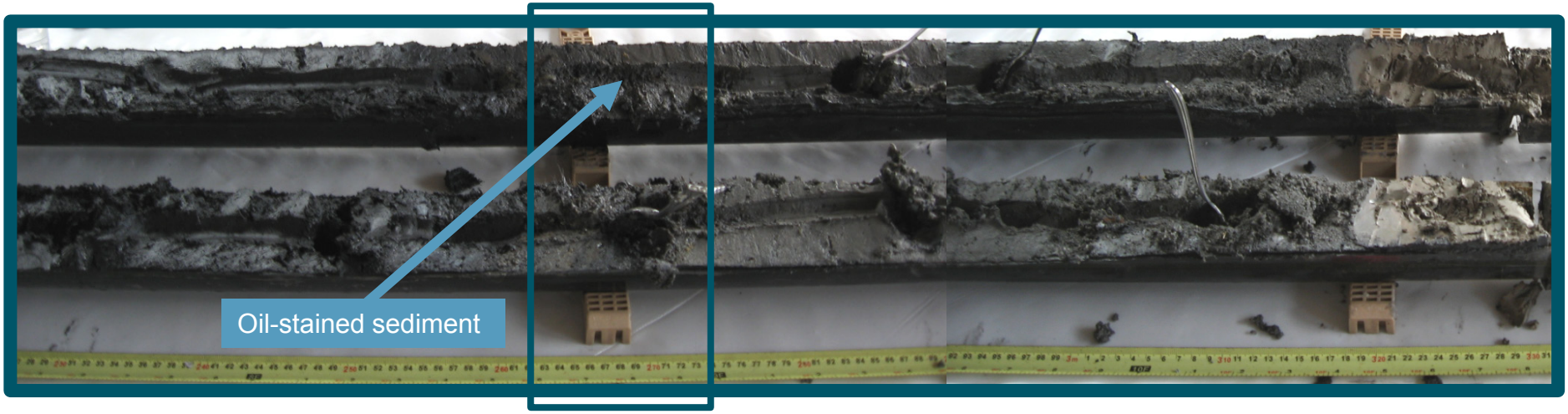
NC282SC-A Phase 2 Core: Visual observation of sheen (170 to 201 centimeters below mudline); shake test bleb rank 2 (182 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site



NC051ASC Phase 1 USEPA-Identified Core: Oil-stained visual observation (150 to 184 centimeters below mudline; 186 to 322 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site



NC069SC-A Phase 2 Core: Saturated visual observation (475 to 479 centimeters below mudline); shake test bleb rank 4 (479 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site



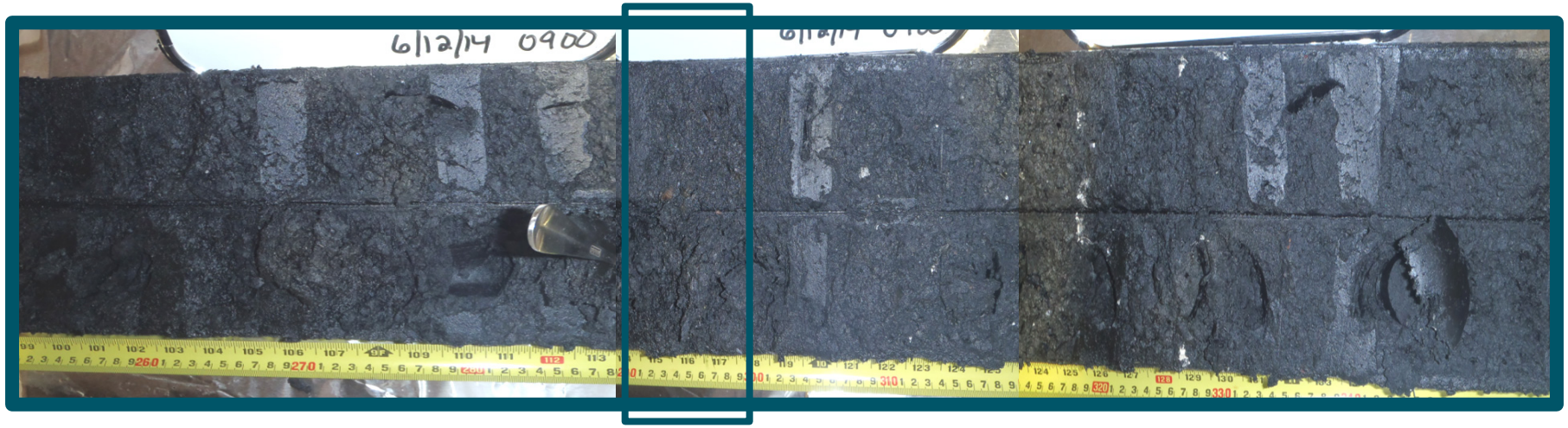
NC069ASC Phase 1 USEPA-Identified Core: Oil-stained visual observation (262 to 274 centimeters below mudline); adjacent to USEPA-identified potential upland NAPL site

EK078SC-C Phase 2 Core: Visual observation of blebs (60 to 90 centimeters below mudline); shake test bleb rank 3 (70 centimeters below mudline)

EB040SC-D Phase 2 Core: Visual observation of sheen (290 to 355 centimeters below mudline); shake test bleb rank 3 (300 centimeters below mudline)

Figure C-C-8
Category 1B Additional Evaluation Photographs – Area G – 1
NAPL Evaluation
Newtown Creek RI/FS

EB040SC-E Phase 2 Core: Visual observation of blebs (150 to 208 centimeters below mudline); shake test bleb rank 3 (150 centimeters below mudline)



EK083SC-C Phase 2 Core: Visual observation of blebs (290 to 300 centimeters below mudline); shake test bleb rank 3 (300 centimeters below mudline)